REDACTED VERSION

SCREENING SITE INSPECTION

of

WILEY POST AIRPORT

(OKD987070059)

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1. INTRODUCTION

The Region VI Field Investigation Team (FIT) was tasked by the U.S. Environmental Protection Agency (EPA) under Technical Directive Document (TDD) F-06-9009-15 to conduct the Screening Site Inspection (SSI) of Wiley Post Airport (OKD987070059) in Bethany, Oklahoma County, Oklahoma.

1.1 SCREENING SITE INSPECTION OBJECTIVES

The SSI evaluates the potential risks associated with hazardous waste generation, storage and disposal at the site. It expands upon data collected during the Preliminary Assessment (PA) and identifies data gaps. Information obtained during the SSI supports the management decision of whether the site proceeds to the Listing Site Inspection (LSI) or receives the classification of No Further Action under the Superfund Amendments and Reauthorization Act (SARA).

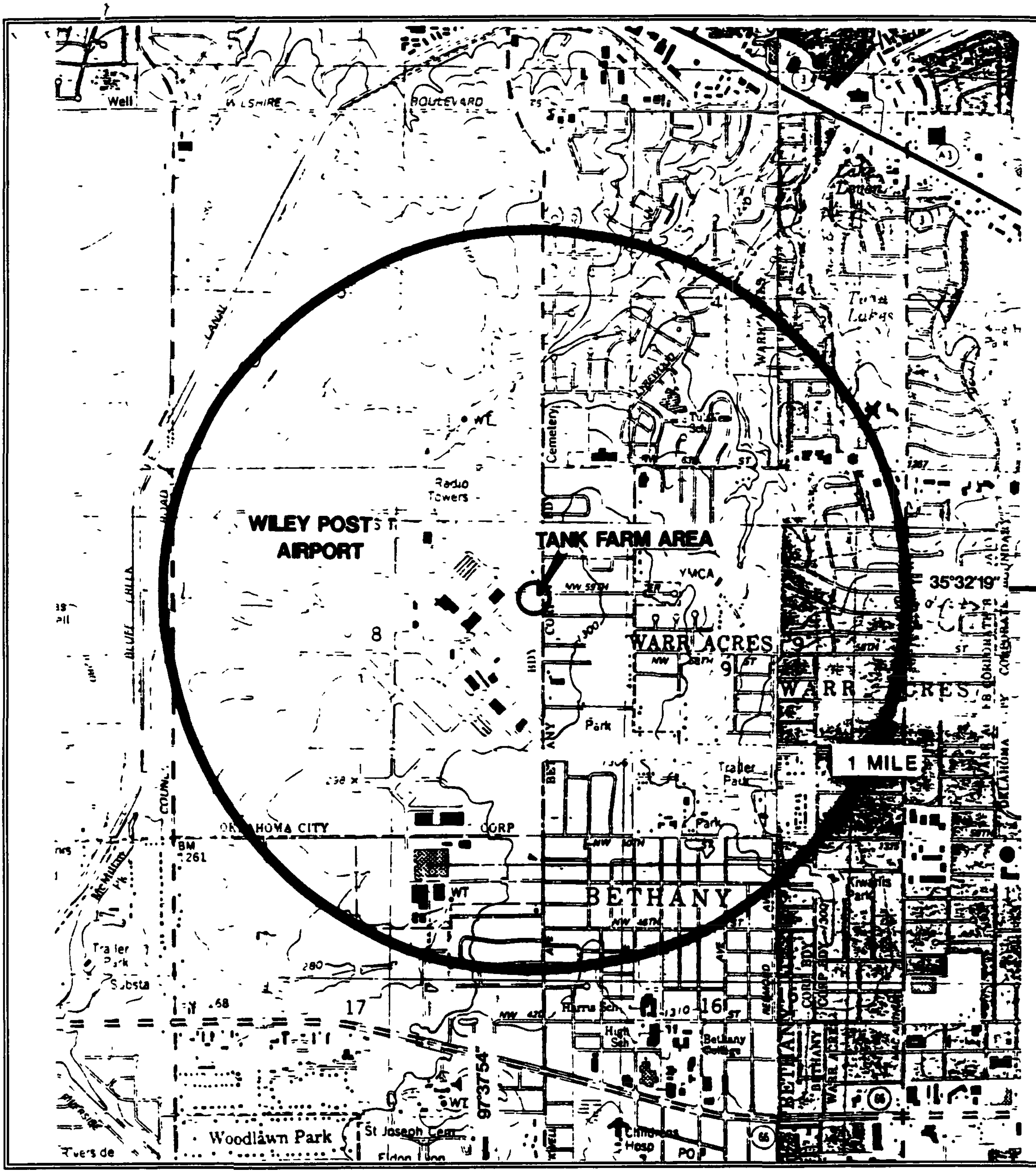
1.2 SITE DESCRIPTION AND HISTORY

The Wiley Post Airport (WPA) is an active, non-commercial airport, located at N.W. 50th and Rockwell streets in Bethany, Oklahoma County, Oklahoma. The airport occupies 1,275 acres at the northwest edge of Bethany, an Oklahoma City suburb, at geographical coordinates 35°32'10" north latitude and 97°37'54" west longitude (Figure 1) (Ref. 1; Ref. 3; Ref. 10).

Areas of concern are the 26 Underground Storage Tanks (USTs) which contain aviation gasoline, Jet Fuel A, waste oils and leaded and unleaded gasolines. Fifteen are located in the WPA Main Fuel Storage Facility. The remaining 11 are located at several hangars (Ref. 3, Attachment A). Two of the fifteen USTs located at the Main Fuel Storage Facility and eight USTs from several hangars have been removed, and removal has been documented. Two others near the Triton Air Hangar reportedly have been removed and one remains in place and is scheduled for removal (Ref. 4, p. 5; Ref. 5, p. 4; Ref. 6, pp. 1-2; Ref. 7, p. 1, 4; Ref. 11).

The Oklahoma City Airport Authority chose to remove the tanks at the hangars because they were no longer needed. Atlas Paving contracted Petroleum Marketers Equipment Co. (PMECO) to remove three USTs at WPA. On November 9, 1989, a 550 gallon waste oil tank was removed at Hangar 3 and a 1,000 gallon unleaded tank and a 300 gallon waste oil tank were removed from Hangar 4 (Ref. 4, p. 5, Figure 5). The unleaded UST had previously been used for fueling of company vehicles, and waste oil tanks were utilized by the leasing companies for disposal of used motor oil (Ref. 4, p. 5). Upon removal, all USTs were visually inspected by PMECO for signs of corrosion or holes in the tank. The USTs were bare steel. The 550 gallon waste oil tank at Hangar 3 was in good condition and showed some signs of pitting, but no holes were discovered. The 300 gallon waste oil and 1,000 gallon unleaded tank removed from Hangar 4 were in poor condition. There were holes up to ¼ of an inch along the bottoms and ends of both tanks (Ref. 4, p. 6).

On February 16, 1990, a 550 gallon waste oil tank was removed at Hangar 2 and a 550 gallon waste oil tank removed from Hangar 3C. On February 17, 1990 a



N

0 2,000 FT

SCALE 1 : 24,000

FIGURE 1
SITE LOCATION MAP
WILEY POST AIRPORT
BETHANY, OKLAHOMA
OKD987070059

QUADRANGLE LOCATION
BETHANY, OK
BRITTON, OK
OKLAHOMA CITY, OK
MUSTANG, OK

1,000 gallon unleaded tank was removed from Hangar 3A (Ref. 5, p. 4, Figure 3, 4 and 5). Males Brothers contracted PMECO to remove these three USTs. The unleaded UST had previously been used for fueling of company vehicles and waste oil tanks were utilized by the leasing companies for disposal of used oil. Upon removal, all USTs were visually inspected by PMECO for signs of corrosion or holes in the tank. The USTs were bare steel. The 550 gallon waste oil tanks at Hangars 2 and 3C were in fair condition and showed some signs of pitting, but no holes were discovered. The 1,000 gallon unleaded tank removed from Hangar 3A was in good condition (Ref. 5, p. 4).

On May 14, 1990, TECHRAD Environmental Services, Inc. notified the Oklahoma Corporation Commission (OCC) of the removal of two USTs at WPA. The removal took place on April 16, 1990 and involved the removal of one 500 gallon waste oil UST from the Hangar 8 facility and one 4,000 gallon gasoline UST from the Hangar 9 facility, owned by the Airport Trust Department, City of Oklahoma City (Ref. 3, Attachment A, p. 3; Ref. 6, p. 2). The 4,000 gallon gasoline UST had been unused for eight years prior to removal. The 500 gallon waste oil UST was in use until the time of removal. Both tanks were inspected after removal and one small pinhole was discovered at the bottom of the 500 gallon waste oil UST (Ref. 6, p. 2).

TECHRAD notified the OCC on April 1, 1991 of the removal of two USTs located at the Main Fuel Storage Facility. Removal occurred on January 15, 1991 and consisted of one 8,000 gallon diesel UST and one 3,000 gallon gasoline UST. The tanks were constructed of bare steel, but no indication was given of their integrity at time of removal (Ref. 7, pp. 1-6).

The Air Center, Inc. site (CERCLIS No. OKD980750319) is located on the WPA property, occupying Hangar 8. The Air Center, Inc. site is an inactive aircraft renovation and paint stripping facility which ceased operations in March 1984 (Ref. 14, pp. 1-4, 6). This site has previously been investigated by a FIT SSI and will not be evaluated in this report.

During the week of January 4, 1988, sampling was conducted at Air Center, Inc. by the FIT. The FIT sampling indicated the presence of lead in the City of Bethany's municipal water wells (No. 21 and No. 23) located within 1 to 2 miles of the site (Appendix B) (Ref. 8, p. 4).

The FIT was then tasked to resample the City of Bethany's water wells (No. 21 and 23) that were located near the Air Center, Inc site. Resampling of these wells was conducted by the FIT on August 22, 1988. Analyses revealed lead levels below Primary Drinking Water Standard (PDWS) levels (Ref. 9, p. 1-2).

Currently WPA operates and maintains 15 USTs which are located in the Main Fuel Storage Facility. These tanks are regularly maintained and vary in size and contents (Ref. 3, Attachment A). WPA authorities indicated that these are visually inspected annually. If a tank appears to be suspicious it is then mill tested to check the epoxy coating. WPA operates up to the Federal Aviation Administration 139 code for larger commercial airports even though this is not required (Ref. 10).

Other areas of concern are the omission from a list prepared by WPA of two tanks located at Hangar 8B (Air Center, Inc. site), and the fact that Hangar 8B does not exist. The hangar identified as 8B by the FIT is actually Hangar 8A (Figure 2)(Ref. 8, Figure 1).

1.3 SUMMARY OF PRELIMINARY ASSESSMENT

The PA, completed by the FIT August 22, 1990, stated that the function of the USTs at WPA is to store Jet Fuel A for aviation use. The storage tank battery consists of 17 USTs which have a combined holding capacity of 228,000 gallons. Lead is an additive of Jet Fuel A, and analytical results of on-site and off-site samples (at the Air Center, Inc. site) revealed elevated levels of chromium and lead. The primary pathways of concern are ground water and surface water. The PA stated that leakage of contaminants from the tanks would severely impair ground water resources. The City of Bethany receives its entire domestic water supply from the Garber Wellington aquifer, which lies less than 100 feet below the site. Lake Overholser and Stinchcomb Wildlife Refuge are at the receiving end of Bluff Cliffs Canal, which serves as the drainage pathway for the WPA. The soil in the area has low permeability and the area is not likely to flood. Runoff of contaminants into the drainage canal would have an impact on these two areas (Ref. 2, p. 5).

2. DATA COLLECTION

Non-sampling and sampling data collected during the SSI are addressed in this section.

2.1 ON-SITE RECONNAISSANCE INSPECTION

The FIT did not note areas of visual contamination during the on-site reconnaissance inspection of December 3, 1990. FIT members present during the on-site reconnaissance inspection were Don Hudnall, Jr. and Robert Taaffe. Mr. Wayne Fuller, WPA General Manager, informed the FIT that he initiated the UST removal process in 1989. The USTs range from 25 to 30 years old and were coated on an irregular basis. TECHRAD was contracted to conduct removal. Contaminated soil was disposed by Waste Management. The resulting depression from the tank removal was filled with clean soil. Most of the tank location areas have been covered with concrete and converted into part of the airport parking area (Appendix A)(Ref. 3, p. 1, Attachment A).

The FIT toured the above-ground tank area on the main tank concrete pad. Spills or other areas of potential contamination were not identified (Ref. 3).

2.2 SAMPLING INSPECTION

After reviewing closure plans and analytical data from the UST removals, the FIT and EPA Region VI Regional Project Officer Ed Sierra determined that the USTs and their contents were not under CERCLA jurisdiction (Ref. 12). The on-site reconnaissance inspection indicated that many areas of tank removals were covered with concrete and that the site appeared clean (Ref. 3; Ref. 13). With the information available, it was determined that the site would not be sampled (Ref. 13).

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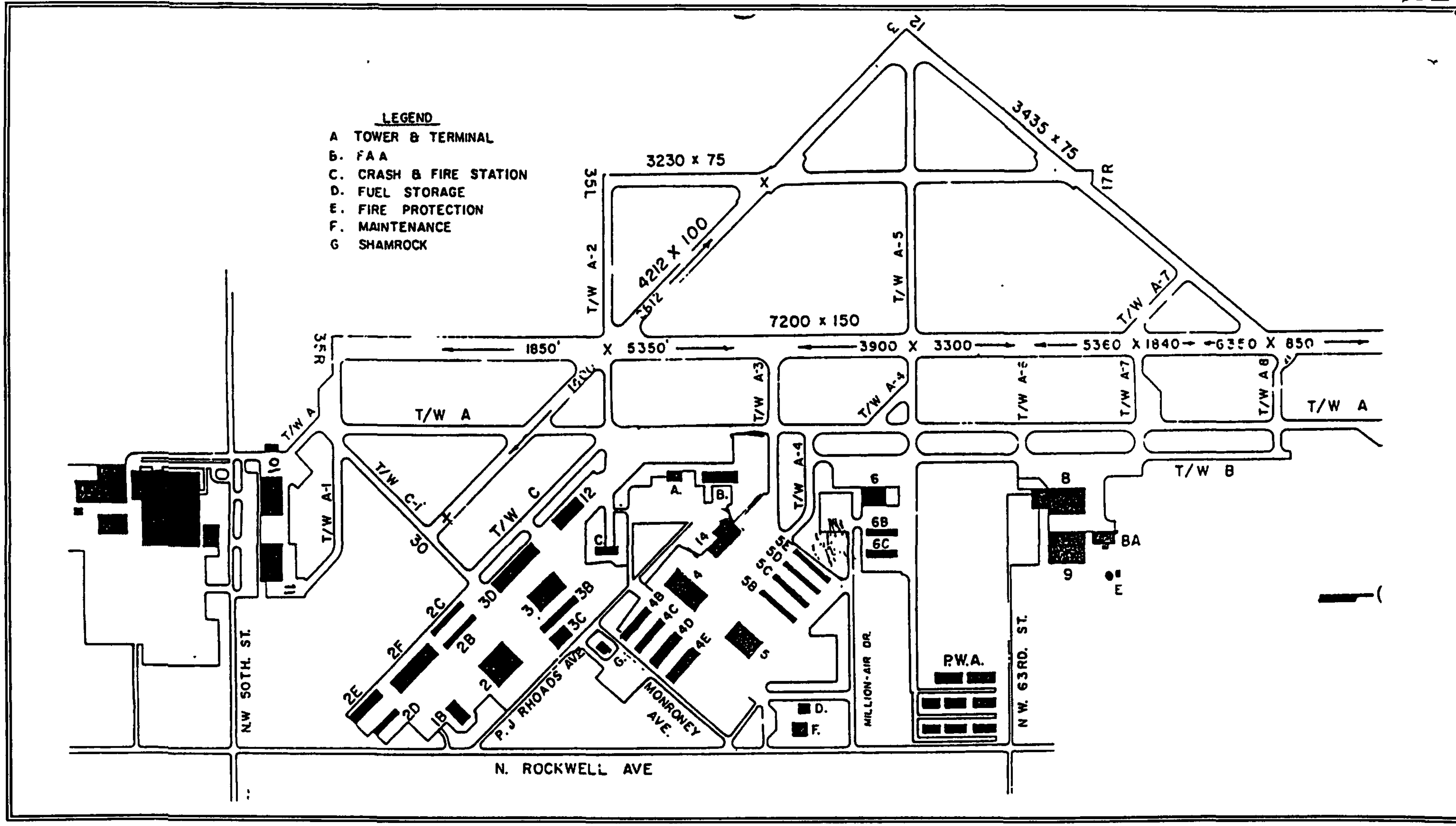


NOT TO SCALE

FIGURE 2
SITE SKETCH
WILEY POST AIRPORT
BETHANY, OKLAHOMA
OKD987070059

2.3 NON-SAMPLING DATA

Non-sampling data and analysis are not addressed due to the fact that the site was not sampled and because there were no on-site sampling data collection activities during the FIT investigation.

3. ANALYTICAL RESULTS

During the week of January 4, 1988, the FIT conducted sampling of the Air Center, Inc. site at WPA. The FIT sampled wells No. 21 and 23 of the Bethany Municipal Water System. Analyses indicated 0.176 ppm and 0.066 ppm of lead in these wells (Ref. 8, p. 4, Table 5).

The FIT was tasked to resample the two Bethany wells by EPA Region VI. Wells No. 21 and 23 were resampled on August 22, 1988. Analysis of the samples indicated reduced levels of lead for Wells No. 21 and 23 at 0.0076 ppm and < 0.005 ppm, respectively (Ref. 9, pp. 1-2, Table 1).

During the August 22, 1988 sampling, the FIT collected information to determine additional potential contributors of lead contamination. This information was collected by drive-bys of local industry and through contact with state officials (Ref. 9, p. 2-3). It was at this time that WPA's UST Main Fuel Storage Facility battery was considered as a possible alternate source of lead contamination (Ref. 9, p. 3).

On November 7, 1988, as a result of a citizen's complaint, the FIT collected samples from the municipal wells which provide drinking water to the Community of Silver Lake. The Community of Silver Lake is located approximately 2.1 miles northeast of the Air Center, Inc. site (Ref. 15, p. 1, Figure 1). The Silver Lake system has two wells serving 85 families. According to the State Health Department, the well water contains naturally high levels of arsenic, chromium and selenium. In order to lower the elevated levels of contaminants, the well water is mixed with 20% treated Oklahoma City water (Ref. 15, pp. 1-2, 4-5, Attachment A).

Analyses of the samples collected during the November 7, 1988 sampling revealed the presence of arsenic, chromium and selenium at levels above Primary Drinking Water Standards. Chromium is the only contaminant detected that could be attributable to the Air Center, Inc. site, based on the detection of chromium in samples collected on the Air Center property. However, due to the depth of the wells (600 and 635 feet, respectively) and the distance (2.1 miles) between the Silver Lake wells and Air Center, it could not be conclusively determined that contamination from Air Center is affecting the Silver Lake Wells (Ref. 15, pp. 1-5, Table 2).

WPA initiated the removal of USTs from the area around the Hangar Facilities in 1989, due to ages of the tanks and the potential liability, and because they were no longer needed (Ref. 10).

PMECO's environmental specialist collected soil samples from the November 9, 1989 UST excavations after UST removal. The soil samples were collected from the sidewalls and bottom of the tank excavation area. During the excavation, faint gasoline and hydrocarbon odors were detected in the sand backfill adjacent to the USTs at Hangar 4. PMECO then conducted ambient temperature headspace (ATH) analyses on the soil samples collected from the excavation sidewalls and bottom. The ATH method consisted of collecting composite soil samples and placing the soil in a glass container, leaving a vacant headspace in the glass container. The headspace gas in each sample was then analyzed for organic vapors using a portable HNu photoionization detector. HNu readings from the Hangar 3 waste oil UST excavation ranged from 1.6 to 4.0 ppm. HNu readings from the unleaded UST excavation at Hangar 4 were 1,200 ppm. HNu readings from the waste oil UST excavation at Hangar 4 were 300 ppm (Ref.4, p. 7, Figures 3, 4 and 5).

Representative samples of the soil in the excavation areas were taken where the highest HNu readings were detected (Ref. 4, p. 7). The samples were sent to Southwell Laboratory and analyzed for benzene, toluene, ethyl benzene and xylenes (BTEX) (for the gasoline tank) and total petroleum hydrocarbon (TPH) (for the waste oil tanks). Results of laboratory analysis for the waste oil UST at Hangar 3 showed < 10 ppm TPH and BTEX. Analysis of samples from the waste oil UST at Hangar 4 showed 1,462 mg/Kg of TPH. Analysis of the samples from the Hangar 4 unleaded UST revealed 3.4 ppm of benzene, 22.4 ppm toluene, 10.7 ppm ethyl benzene and 55.7 ppm total xylenes (Ref. 4, Appendix B, pp. 2, 4, 6).

The 550 gallon waste oil UST at Hangar 3 was in good condition with some pitting, but no holes were discovered. The 300 gallon waste oil and 1,000 gallon unleaded USTs removed from Hangar 4 were in poor condition with holes up to ⅛ inch along the bottoms and ends of the tanks (Ref. 4, p. 6).

Eight soil borings were drilled by Oklahoma Testing Laboratory under the supervision of PMECO, on the property to evaluate the subsurface stratigraphy and delineate the horizontal and vertical extent of gasoline fuel impact to the ground water (Ref. 4, pp. 7-8, Figure 2). Soil boring depths ranged from 10.5 to 16.0 feet in depth. Soil samples were taken at 5 foot intervals with a split spoon sampler (Ref. 4, pp. 7-8). Ground water was encountered in all soil borings. The average depth below the surface was 10.1 feet (Ref. 4, p. 8). Ground water samples from soil borings No. 1, 3, 4, 6, 7 and 8 were sent to Southwell Laboratory for analysis. Ground water from soil boring No. 1 had a slight sheen. Soil borings No. 1 and 2 had a strong odor of gasoline. Soil boring No. 5 had a thin layer of oil floating on the sample retrieved. Laboratory analysis of ground water samples from soil borings No. 1 and 2 showed dissolved gasoline constituents (Ref. 4, pp. 10-11, Table 1, Appendix B). Ground water results from the rest of the samples retrieved were below detectable limits (Ref. 4, p. 11).

The PMECO report stated that soils around the unleaded UST removed from the area west of Hangar 4 are impacted by gasoline down to the shallow water table, that soils around the 300 gallon waste oil UST removed from the west side of Hangar 4 are impacted by waste oil, and that phase separated hydrocarbons are present in all soil borings and have spread across the property on the shallow water table (Ref. 4, pp. 11-12).

PMECO placed the contaminated soil back into the excavations at Hangar 4 at the request of the Oklahoma Airport Authority. Plastic sheeting was placed over the tank excavation to prevent water from entering. The Airport Authority reportedly chose to do this due to concern for the integrity of the building located next to the tank excavation (Ref. 4, pp. 11-12).

On February 16 and 17, 1990, a 550 gallon waste oil UST was removed from Hangar 2, a 550 gallon waste oil UST removed from Hangar 3C and a 1,000 gallon unleaded UST removed from Hangar 3A by PMECO (Ref. 5, p. 4). No holes were discovered in any of the three USTs and ground water was not encountered in any of the excavations (Ref. 5, pp. 4-6). PMECO's environmental specialist collected soil samples for ATH analysis (Ref. 5, p. 5). HNu readings of soil samples from the Hangar 2 waste oil UST excavation ranged from background to 1.1 ppm. HNu readings from the Hangar 3C waste oil UST excavation ranged from background to 0.8 ppm. HNu readings from the Hangar 3A unleaded gasoline UST ranged from 180 to 400 ppm (Ref. 5, Figures 3-5).

Soil samples were collected from the excavations of the highest HNu measurements. The samples were analyzed by Southwell Laboratory for TPH (waste oil tank samples) and BTEX (unleaded tank samples). Results revealed that the Hangar 2 and 3C soil analyses were below detectable limits (< 1.0 ppm) for TPH. Analysis for the Hangar 3A samples revealed a BTEX concentration of 161.2 ppm (Ref. 5, p. 7). The Hangar 3A analyses revealed 19.8 ppm of benzene, 20.8 ppm of toluene, 38.3 ppm of ethyl benzene and 82.3 ppm of total xylenes (Ref. 5, Appendix B, p. 25).

TECHRAD notified the OCC of the removal of a 500 gallon waste oil UST at Hangar 8 and a 4,000 gallon gasoline UST at Hangar 9 on April 16, 1990 (Ref. 6, p. 2). Both tanks were inspected after removal and one small pinhole was discovered in the bottom of the 500 gallon waste oil UST. Ground water was not encountered during the excavations (Ref. 6, p. 2). Soil samples from the bottoms of the excavations and backfill materials were analyzed by TECHRAD. TPH results for the Hangar 8 excavation ranged from 5 mg/Kg in the backfill material to 250 mg/Kg in the excavation bottom (Ref. 6, p. 4). Analysis of the excavation materials from Hangar 9 revealed TPH of 5 to 10 mg/Kg (Ref. 6, p. 5). Contamination levels were exceeded for the Hangar 8 waste oil UST excavation and 20 cubic yards of contaminated material were removed and taken to Laidlaw Landfill, 7001 S. Bryant, Oklahoma City, for disposal (Ref. 6, pp. 3, 8-9). Analysis of the contaminated backfill material revealed that it was non-hazardous (Ref. 6, p. 8).

Analysis of the Hangar 8 excavation after contaminated soil removal revealed TPH at 40 to 50 mg/Kg. E.P. Toxicity Extraction testing on the backfill material indicated 0.83 mg/L barium, 0.01 mg/L cadmium and 0.01 mg/L selenium (Ref. 6, p. 12).

On January 15, 1991, an 8,000 gallon diesel UST and a 3,000 gallon gasoline UST were removed from the Main Fuel Storage Facility and TECHRAD analyzed the samples. Analysis of the soils from the 8,000 gallon UST excavation revealed TPH at < 0.1 mg/Kg (Ref. 7, pp. 1-2). BTEX analysis of the 3,000 gallon gasoline UST excavation revealed < 0.04 mg/Kg benzene, < 0.04 mg/Kg toluene,

< 0.04 mg/Kg ethyl benzene and < 0.04 mg/Kg xylene, with a TPH of < 0.1 mg/Kg (Ref. 7, p. 3).

No documentation was supplied to the FIT indicating the integrity of the tanks upon removal or whether ground water was encountered during excavation.

The Oklahoma State Department of Health (OSDH) is now the regulatory body for UST removal. The OSDH was involved in the January 15, 1991 UST removals and indicated that the USTs were closed properly, and a verbal closure certification was issued with a written closure certification to follow (Ref. 16). Previously the OCC handled UST closures. The OCC stated that it was aware of the November 1989 removal, in which ground water contamination was evident, and turned the matter over to the Oklahoma Water Resources Board (OWRB). According to Ms. Tana Walker of OCC, the OCC overseeing engineer would have given verbal approval of closure certification for the previous removals (Ref. 17).

4. SOURCE WASTE CHARACTERISTICS, PATHWAYS AND TARGETS

This section characterizes the environmental pathways and associated targets of potential contaminant migration from the facility.

4.1 SOURCE WASTE CHARACTERISTICS

On November 9, 1989, WPA removed three USTs from the Hangar 3 and 4 facilities. This involved a 550 gallon waste oil UST at Hangar 3, and a 1,000 gallon unleaded and a 300 gallon waste oil UST at Hangar 4 (Ref. 4, p. 5). Once removal was completed, it was discovered that the two USTs from Hangar 4 were in poor condition, and that the USTs had holes in the bottoms and in the ends (Ref. 4, p. 6). There was evidence that the shallow ground water had been impacted (Ref. 4, p. 10).

A May 14, 1990 removal report of a 500 gallon waste oil UST at Hangar 8 indicated that the UST had a small pinhole discovered after removal. The report stated that ground water was not encountered during excavation. (Ref. 6, pp. 1-2). Contamination levels were exceeded and 20 cubic yards of non-hazardous contaminated soil were disposed at Laidlaw Landfill (Ref. 6, pp. 8-9).

The Air Center, Inc. site was investigated by the FIT in January 1988 and potential source waste characteristics from this site will not be addressed (Ref. 8).

4.2 GROUND WATER PATHWAY

WPA is situated over consolidated sedimentary rocks (red beds) of Permian age and unconsolidated terrace deposits and alluvium of Quaternary age. In ascending order the Permian rocks exposed in Cleveland and Oklahoma Counties are Wellington Formation, Garber Sandstone, Hennessey Shale, Duncan Sandstone and Chickasha Formation. The Garber and Wellington, because of their lithologic similarity, constitute a single aquifer system (Ref. 18, p. 18).

The principal source of ground water used for municipal and industrial purposes are the Garber Sandstone and Wellington Formation, both of which consist of lenticular beds of sandstone alternating with shale (Ref. 18, p. 3).

The Garber is approximately 350 feet thick in central Oklahoma County. The Wellington is approximately 500 feet thick in the outcrop area, but attains a thickness of 700 feet in the subsurface. Therefore, the two formations as a unit have a total thickness of 800 to 1,000 feet (Ref. 18, p. 21).

Wells obtain fresh water from the Garber Wellington at depths of 100 feet or less in the areas of outcrop, and at maximum depths of 1,000 feet in the Midwest City area. The approximate depth below land surface of the base of fresh water body is 800 feet in the Oklahoma City-Lake Hefner area (Ref. 18, pp. 29-30).

The Hennessey Shale consists of reddish-brown shale containing layers of siltstone and fine grained sandstone. The Hennessey Shale has a total thickness of 200 to 300 feet in the Oklahoma City area and less than 400 feet northwest of Lake Hefner (Ref. 18, pp. 21-22). Because of its lithology, the Hennessey Shale is poorly permeable; however, it is an aquifer that furnishes small quantities of water to rural domestic and stock wells (Ref. 18, p. 22). The Hennessey Shale acts as a confining layer for the Garber Wellington (Ref. 19).

The Chickasha and Duncan are poorly permeable and have little value as an aquifer. In general, the water is suitable for human consumption, but in some places contains too much dissolved gypsum or is too highly mineralized even for stock use (Ref. 18, p. 23). The Chickasha and Duncan, which conformably overlie the Hennessey Shale, are 150 to 200 feet thick and consist of sandstone, siltstone, siltstone conglomerate and shale (Ref. 18, p. 22).

The Quaternary terrace deposits consist of lenticular beds of sands, silt, clay and gravel (Ref. 18, p. 23). Replenishment of ground water in the terrace deposits comes mainly from infiltration of precipitation that falls on the terrace surface (Ref. 18, p. 25).

The terrace deposits on the upland between Lake Overholser and Lake Hefner, known locally as the Bethany terrace, is the source of ground water pumped by the City of Bethany (Ref. 18, p. 25).

The depth to water generally is less than 30 feet below land surface (Ref. 18, p. 25).

Along the Canadian and North Canadian Rivers, the alluvium is a band averaging approximately 2 miles in width. The alluvium consists mostly of lenticular beds of sand, silt and clay. The alluvium ranges in thickness from a few inches to approximately 90 feet (Ref. 18, p. 26). There is not a distinct separating layer between the terrace deposits and alluvium. A confining layer is not present between the surface and the terrace deposits and alluvium (Ref. 19).

Net precipitation for the Oklahoma City area is 7.09 inches (Ref. 39, p. 41).

The City of Bethany currently utilizes 27 wells for drinking water (Ref. 37). Twenty-five tap the unconsolidated alluvium and terrace deposits. The three remaining wells tap the Garber Wellington. Water from the alluvium wells is pumped to the water plant, blended and treated for hardness (Ref. 20). Water from the Garber wells are chlorinated and pumped into the system (Ref. 37). Two City of Bethany wells, G-2 and Well No. 23, lie within 0.5 to 1 mile of the Main Fuel Storage Facility (Appendix B) (Ref. 21). Well G-2 taps the Garber Wellington and Well No. 23 has a static water level at 42 feet (Ref. 21, p. 7). There are 16 City of Bethany wells that tap the alluvium and one that taps the Garber Wellington within the 1 to 2 mile distance radius, six wells that tap the alluvium within the 2 to 3 mile radius, and one well that taps the Garber Wellington within the 3 to 4 mile radius (Appendix B) (Ref. 21, pp. 3-8). The City of Bethany Well No. 16 is no longer used by the City but is now used by the Tri-City ballpark for its irrigation and sprinkler systems (Ref. 37).

Approximately 26,000 people are served by the City of Bethany water system (Ref. 22). The City of Bethany has no alternate source of drinking water (Ref. 23).

The City of Warr Acres lies within the 4 mile target distance limit (Appendix B). Drinking water for the City of Warr Acres is supplied by Oklahoma City (Ref. 24).

The Community of Silver Lake is located 2 to 3 miles north of WPA. Silver Lake operates two wells that are 600 feet and 635 feet deep. The wells extract water from 560 to 590 feet and from 418 to 635 feet, respectively, and tap the Garber Wellington (Ref. 15, pp. 1, 4-7). The well water from both the wells is mixed with 20% Oklahoma City water to dilute elevated levels of chromium, selenium, arsenic and zinc that occur naturally in the ground water (Ref. 15, p. 2, Appendix A). Oklahoma City is supplied by three reservoirs: Lake Hefner, Lake Overholser and Lake Draper (Ref. 22). In 1982, analytical results revealed the following: arsenic - 0.058 ppm, selenium - 0.086 ppm, chromium - 0.043 ppm and zinc - 0.151 ppm. In the mid 1980s, Silver Lake began buying treated water from Oklahoma City, which it blended in storage tanks (Ref. 15, Appendix A). Eighty-five families are served by the Silver Lake water system (Ref. 15, p. 1).

On November 7, 1988, as a result of a citizen's complaint, the FIT sampled the Silver Lake wells. Analyses of the samples revealed the presence of arsenic, chromium and selenium at levels above the PDWS. Chromium was the only detected contaminant considered to be attributable to the Air Center, Inc. site, based on the detection of chromium in samples collected on the Air Center property (Ref. 15, p. 3, Table 2).

As part of the Air Center, Inc. inspection, a well survey was conducted for a 3 mile radius. The survey revealed that there were 2 domestic wells from 0 to 1 mile, 9 domestic and monitoring wells from 1 to 2 miles, 15 domestic and industrial wells from 2 to 3 miles and 9 other domestic wells located greater than 3 miles (Ref. 25, pp. A1-A2).

An area of concern is the relative proximity of the City of Bethany wells that tap shallow alluvium and terrace deposits located within 1 to 2 miles southwest of WPA (Appendix B). Documentation from UST removals initiated at WPA indicate that on at least one occasion, the shallow ground water had been impacted from leakage from waste oil and unleaded USTs (Ref. 4, pp. 11-12).

4.3 SURFACE WATER PATHWAY

WPA is situated on the Bethany silt loam soil series. The Bethany series are naturally well drained with a 0 to 1% slope. Internal drainage is medium and permeability is slow. Water holding capacity is high (Ref. 26, p. 6).

Overland migration from the site is west-southwest into an intermittent stream flowing south, parallel to the east Bluff Creek Canal (Appendix A, Photographs 13-15; Appendix B) (Ref. 27). This intermittent stream acts as drainage for the western and southern halves of WPA (Appendix B). The drainage area, based on topographic maps is estimated to be greater than 50 acres (Appendix B).

Bluff Creek Canal is a manmade, mostly concrete canal that runs from south to north connecting the North Canadian River to Lake Overholser and Lake Hefner (Appendix B) (Ref. 27; Ref. 30). Oklahoma City utilizes surface water from both of these reservoirs (Ref. 22).

A concern for this surface water pathway is that the intermittent stream receiving runoff from the western and southern halves of WPA drains into Lake Overholser just south of its confluence with the North Canadian River and the Stinchcomb Wildlife Refuge, approximately 2.2 miles from the site (Appendix B). Water from the North Canadian River is diverted by floodgates via Bluff Creek Canal to replenish Lake Hefner or is diverted to replenish Lake Overholser. Lake Overholser is used for drinking water only in the summertime (Ref. 30).

The intake for Lake Hefner is located at the north end of the lake by the dam and is not considered to be in the downgradient 15 stream mile target distance. The intake for Lake Overholser is located at the point where the North Canadian River exits the lake in the southeastern end (Appendix B) (Ref. 30). It is not known if there are any other surface water intakes on the North Canadian River within the 15 mile target distance.

Overland migration for the northern and eastern portions of WPA around the old Air Center, Inc. site is to the east via an intermittent stream into Woodlake Pond, less than 1 mile off-site (Appendix B). Woodlake is a perennial pond and was evaluated during the 1988 Air Center, Inc. inspection (Ref. 8, p. 2; Ref. 28). The drainage area, based on topographic maps is estimated to be less than 50 acres (Appendix B).

The northernmost end of WPA drains into Ski Island and Silver Lake, which are used for swimming, fishing and boating. They are fed by Spring Creek and are connected by a spillway (Appendix B) (Ref. 29). The drainage area, estimated from topographic maps is greater than 50 acres (Appendix B). Ski Island and Silver Lake are situated approximately 1.5 miles north of WPA (Appendix B).

The average annual pounds of fish taken from Lake Overholser, Woodlake Pond, Silver Lake and the North Canadian River is not known.

WPA is situated in a Zone C flood area as designated by Federal Emergency Management Agency (FEMA). This area is considered to lie outside of a 500 year flood area (Ref. 32). The two year, 24 hour rainfall average is 3.5 to 4 inches (Ref. 33).

Average annual rainfall for Oklahoma City is 31.9 inches (Ref. 26, p. 1)

There are no critical habitats in the Oklahoma County area, however; the Stinchcomb Wildlife Refuge is considered an important area for migratory birds and Least Terns have been seen foraging the area (Ref. 31). The Least Tern is considered a federally threatened species in Oklahoma and can be found during the breeding season throughout the state, but only in a suitable habitat of bare ground on alluvial islands and sandbars (Ref. 38, pp. 107-108). Oklahoma County is also considered to be in the fall and spring migratory pathway for the federally endangered Whooping Crane (Ref. 38, pp. 113-114).

Another important area is the Rose Lake area. This is a privately owned area located at N.W. 50th and Sara Road, approximately 4 miles west of WPA. This area is approximately 100 to 200 acres and is considered important for migratory birds and Least Terns (Ref. 31).

Neither the Stinchcomb Wildlife Refuge or the Rose Lake area are considered federally or state sanctioned wetlands, but can be considered important wetland habitats for the Least Tern. The ownership and regulatory body for the refuge are not known (Ref. 31; Ref. 32).

4.4 SOIL EXPOSURE PATHWAY

The area of concern being evaluated are several USTs that are not in CERCLA jurisdiction, and are greater than 2 feet below ground surface. Most UST removal areas have been paved with concrete (Ref. 3, p. 1) Petroleum hydrocarbon contaminated soils were taken to Laidlaw Southeast Landfill (Ref. 6, p. 13).

The nearest residence to the location of the UST removals is less than 500 feet east across Rockwell Street. There are metropolitan residential areas to the north, south and east of WPA (Appendix B).

There are no known critical habitats in the Oklahoma County area (Ref. 31). Oklahoma County is also considered to be in the fall and spring migratory pathway for the federally endangered Whooping Crane (Ref. 38, pp. 113-114).

A house count was conducted within a 1 mile radius of the Main Fuel Storage Facility during the May 10, 1991 file check at WPA. Difficulty in determining a precise count was encountered due to the location of three large apartment complexes in the 1 mile radius each with more than 100 units (Ref. 10, Attachment A). Approximately 2,400 homes were counted, not including the three apartment complexes (Ref. 10, Attachment A). The average number of residents per household in Oklahoma County is 2.45 (Ref. 34, p. 49). The calculated number of people living within 1 mile is 5,880.

The number of on-site employees is not known. It is not known if there are any residents on-site.

4.5 AIR PATHWAY

The contaminants of concern would be the gas migration potential of petroleum hydrocarbons associated with the fuels stored in the USTs and the potential for particulate migration from petroleum hydrocarbon contaminated soils from the excavations.

Given the calculation of 5,880 people within the mile radius, or 3.14 square miles, there are approximately 1,873 people per square mile. Therefore, it can be estimated that within the 4 mile radius there are approximately 94,099 people (Appendix B) (Ref. 34, p. 49).

The City of Bethany, whose corporate boundaries lie entirely within the 4 mile target distance limit, has a population of approximately 23,000 (Ref. 35).

There are no critical habitats in the Oklahoma County area, however; the Stinchcomb Wildlife Refuge is considered an important area for migratory birds and the federally threatened Least Terns have been seen foraging the area (Ref. 31; Ref. 38, pp. 107-108).

Another important area is the Rose Lake area. This is a privately owned area located at N.W. 50th and Sara Road, approximately 4 miles west of WPA. This area encompasses approximately 100 to 200 acres and is considered important for migratory birds and the federally threatened Least Terns (Ref. 31; Ref. 38, pp. 107-108).

Neither the Stinchcomb Wildlife Refuge or the Rose Lake area are considered federally or state sanctioned wetlands but are considered important wetland areas (Appendix B)(Ref. 31; Ref. 32).

4.6 GROUND WATER TO SURFACE WATER PATHWAY

There is no evidence to suggest that contamination in this pathway exists. There are no perennial surface water bodies within 1 mile of site waste sources (Appendix B).

5. PROJECT MANAGEMENT

Key personnel and community relations are addressed in this section. There are no perennial surface water bodies within 1 mile of site waste sources (Appendix B).

5.1 KEY PERSONNEL

The initial Project Manager for WPA was Don Hudnall, Jr., FIT Toxicologist, whose responsibilities include obtaining site access, directing and overseeing all on-site and off-site activities. (The current Project Manager is Kevin Jaynes, FIT Biologist.) FIT members present during the on-site reconnaissance inspection were Don Hudnall and Robert Taaffe (site safety officer) whose responsibilities were to monitor environmental conditions for the reconnaissance inspection.

5.2 COMMUNITY RELATIONS

Persons requesting site information will be instructed to submit a Freedom of Information Act Request to: Freedom of Information Officer, U.S. EPA Region VI, 1445 Ross Avenue, Dallas, Texas 75202-2733. Reporters will be instructed to contact the Office of External Affairs at 214/655-2200.

6. CONCLUSIONS

WPA is an active non-commercial airport in Bethany, Oklahoma. It was identified as a possible source for lead contaminated ground water during an investigation of the Air Center, Inc. site on the airport property. There are 26 USTs containing waste oils, jet fuel A, leaded and unleaded gasolines. Fifteen are located in the WPA Main Fuel Storage Facility. Two of the 15 USTs located in the WPA Main Fuel Storage Facility and eight of the Hangar facilities USTs have been removed, and removal was documented. Two others reportedly have been removed and one remains in ground and is scheduled for removal. The USTs and their contents are not under CERCLA jurisdiction.

There is evidence of shallow ground water contamination from the removal of waste oil and unleaded gasoline USTs at Hangar 4. Extent of contamination and remedial activity have not been determined.

The primary area of concern is the ground water pathway and the 27 City of Bethany wells and their proximity to WPA. There are at least 2 wells within 1 mile of WPA and previous analyses has shown increased levels of lead in these wells.

SSI DOCUMENTATION LOG SHEET

SITE: WILEY POST AIRPORT
IDENTIFICATION NUMBER: OKD987070059
CITY: BETHANY
STATE: OKLAHOMA

REFERENCE NUMBER	DESCRIPTION OF THE REFERENCE
1	U.S.G.S. 7.5 Minute Series Topographic Map. Bethany, Oklahoma, 1986. Britton, Oklahoma, 1986. Oklahoma City, Oklahoma, 1986. Mustang, Oklahoma, 1986.
2	Preliminary Assessment of Wiley Post Airport. Prepared by ICF Technology, Inc. for EPA Region VI. August 22, 1990.
3	Memorandum. Wiley Post Airport On-Site Reconnaissance Inspection Logbook. From: Don Hudnall, Jr., FIT Toxicologist. To: File. December 3, 1990. Attachment.
4	Documentation Report On An Underground Storage Tank Removal. Prepared By Petroleum Marketers Equipment Company for Wiley Post Airport. November 17, 1989.
5	Documentation Report On An Underground Storage Tank Removal. Prepared By Petroleum Marketers Equipment Company for Wiley Post Airport. November 17, 1989.
6	Underground Storage Tank Removal Report. Prepared By TECHRAD Environmental Services, Inc. for Wiley Post Airport. May 14, 1990.
7	Underground Storage Tank Removal Report. Prepared By TECHRAD Environmental Services, Inc. for Wiley Post Airport. January 22, 1991.
8	Sampling Inspection Report. Air Center, Inc. Prepared By ICF Technology, Inc. for EPA Region VI. May 20, 1988.
9	Sampling Inspection Report. Resampling Of Municipal Drinking Water Wells Located Near the Air Center, Inc. Site. Prepared By ICF Technology, Inc. October 24, 1988.
10	Memorandum. Continuing Research Investigation and File Check of Wiley Post Airport. From: Kevin Jaynes, FIT Biologist. To: File. May 10, 1991.

11 Record of Communication. Wiley Post Airport, Location of Triton Air, Hangar 6 UST and Remedial Activity at Hangar 4. From: Jim Smith, Construction Manager Oklahoma Airport Planning and Development Board. To: Kevin Jaynes, FIT Biologist, ICF Technology, Inc. May 16, 1991. OKD987070059.

12 Record of Communication. CERCLA Jurisdiction Over the USTs at Wiley Post Airport. From: Ed Sierra, EPA Region VI Regional Project Officer. To: Kevin Jaynes, FIT Biologist, ICF Technology, Inc. May 16, 1991. OKD987070059.

13 Record of Communication. Wiley Post Update. From: Don Hudnall, Jr., FIT Toxicologist, ICF Technology, Inc. To: Barbara Driscoll, Project Officer, EPA Region VI. December 14, 1990. OKD987070059.

14 EPA Form T2070-3 (10-79). Potential Hazardous Waste Site Inspection Report. Air Center, Inc. July 29, 1987. OKD980750319.

15 Site Inspection Report. Sampling Results for Samples Collected From the Community of Silver Lake Municipal Wells Near the Air Center, Inc. Site. Prepared by ICF Technology, Inc. for EPA Region VI. January 10, 1989.

16 Record of Communication. Oklahoma Department of Health Involvement With Wiley Post UST Pulls. From: Kevin Jaynes, FIT Biologist, ICF Technology, Inc. To: David Pruitt, Oklahoma Department of Health. May 15, 1991. OKD987070059.

17 Record of Communication. Wiley Post Airport USTs and OCC Jurisdiction. From: Tana Walker, Oklahoma Corporation Commission. To: Kevin Jaynes, FIT Biologist, ICF Technology, Inc. May 17, 1991. OKD987070059.

18 Wood, P.R., Burton, L.C. Ground Water Resources Cleveland and Oklahoma Counties. Oklahoma Geological Survey Circular 71. 1968.

19 Record of Communication. Ground Water Below the Wiley Post Airport. From: Heather Schijf, FIT Biologist, ICF Technology, Inc. To; Bob Thomas, Hydrogeologist, Oklahoma Water Resources Board. October 21, 1988. OKD987070059.

20 Record of Communication. Active Wells in Bethany, Oklahoma and Update of Previously Obtained Information. From: Dan Bridgeforth, Superintendent, The City of Bethany. To: Kevin Jaynes, FIT Biologist, ICF Technology, Inc. June 6, 1991. OKD987070059.

21 Letter. Well Information. From: Dan Bridgeforth, Superintendent, The City of Bethany. To: Heather Schijf, FIT Biologist, ICF Technology, Inc. OKD987070059.

22 Record of Communication. Water Source. From: Heather Schijf, FIT Biologist, ICF Technology, Inc. To: Dan Bridgeforth, Superintendent, The City of Bethany. April 16, 1987. OKD987070059.

23 Record of Communication. Alternate Source of Drinking Water. From: Heather Schijf, FIT Biologist, ICF Technology, Inc. To: Craig Davis, Bethany Water Plant. October 21, 1988. OKD987070059.

24 Record of Communication. Air Center Well Information. From: Ravinder Joseph, ICF Technology, Inc. To: City of Warr Acres. May, 29, 1987. OKD980750319.

25 Well Log Data for 3 Mile Radius Around Air Center, Inc. OKD980750319.

26 Soil Survey Oklahoma County, Oklahoma. United States Department of Agriculture, Soil Conservation Service, in Cooperation with Oklahoma Agricultural Experiment Station. February, 1969.

27 Record of Communication. City of Bethany Wells and Numbering System. From: Dan Bridgeforth, Superintendent, The City of Bethany. To: Kevin Jaynes, FIT Biologist, ICF Technology, Inc. May 17, 1991. OKD987070059.

28 Record of Communication. Woodlake Pond. From: Ravinder Joseph, ICF Technology, Inc. To: Doug Moore, President, Woodlake Homeowners Association. September 16, 1988. OKD980750319.

29 Record of Communication. Ski Island Lake and Silver Lake. From: Ravinder Joseph, ICF Technology, Inc. To: Bob Myer, Planning and Development, Oklahoma City. September 16, 1988. OKD980750319.

30 Record of Communication. Oklahoma City Reservoirs and Water Supply. From: Kevin Jaynes, FIT Biologist, ICF Technology, Inc. To: Patrick Yonikas, Oklahoma City Water Department. June 27, 1991. OKD987070059.

31 Record of Communication. Stinchcomb Wildlife Refuge and Critical Habitats. From: Kevin Jaynes, FIT Biologist, ICF Technology, Inc. To: John Skeen, Oklahoma Wildlife Conservation Department. June 27, 1991. OKD987070059.

32 Record of Communication. Lake Overholser, Lake Hefner and Stinchcomb Wildlife Refuge. From: Kevin Jaynes, FIT Biologist, ICF Technology, Inc. To: Ken Morris, Oklahoma Water Resources Board. June 27, 1991. OKD987070059.

33 Hershfield, David M. Rainfall Frequency Atlas of the United States. U.S. Department of Agriculture, Soil Conservation Service. Technical Paper Number 40. 1961.

34 Estimates of Households, for Counties: July 1, 1985. U.S. Department of Commerce, Bureau of the Census.

35 Record of Communication. Population of Bethany, Oklahoma. From: Robert Taaffe, FIT Chemist, ICF Technology, Inc. To: Paula Parker, Bethany Chamber of Commerce. August 3, 1990. OKD987070059.

36 Record of Communication. The Location and Status of USTs at Hangar 6 and Triton Air. From: Dan Spitz, Hydrogeologist, TECHRAD Environmental Services, Inc. To: Kevin Jaynes, FIT Biologist, ICF Technology, Inc. May 21, 1991. OKD987070059.

37 Record of Communication. Wells Locations. From: Kevin Jaynes, FIT Biologist, ICF Technology, Inc. To: Graig Davis, Bethany Water Plant. June 28, 1991. OKD987070059.

38 Endangered and Threatened Species of Texas and Oklahoma. U.S. Fish and Wildlife Service. 1987.

39 Letter. HRS Net Precipitation Values. From: Andrew M. Platt, Group Leader, MITRE Corporation. To: Lucy Sibold, U.S. Environmental Protection Agency. May 26, 1988. Attachments.

APPENDIX A

PHOTODOCUMENTATION

This Document Contained Material Which Was Not Filmed/Scanned

Title Wiley Post Airport, Memorandum, Site Photos

Please Refer to the File in Superfund Records Center

This Document Contained Material Which Was Not Filmed/Scanned

Title Wiley Post Airport, Memorandum, Site Negatives

Please Refer to the File in Superfund Records Center

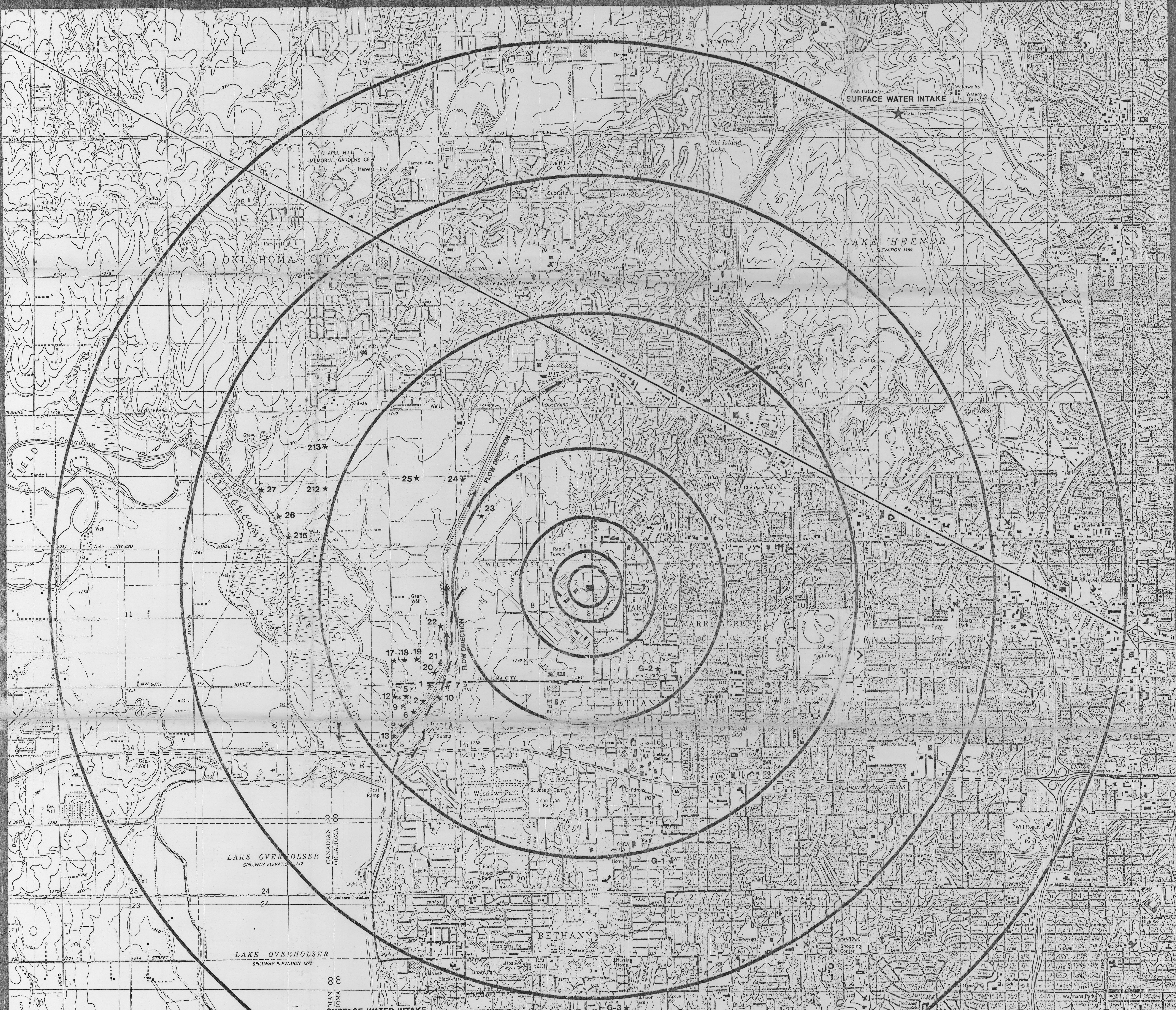
APPENDIX B

FOUR MILE TARGET DISTANCE LIMIT

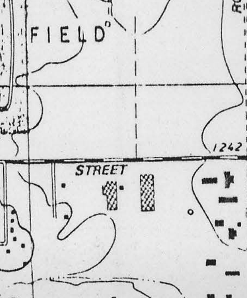
This Document Contained Material Which Was Not Filmed/Scanned

Title Wiley Post Airport, Topographic MAP, Oversized MAP

Please Refer to the File in Superfund Records Center



APPENDIX B
FOUR MILE TARGET DISTANCE LIMIT
WILEY POST AIRPORT
BETHANY, OKLAHOMA
OKD987070059



SCALE 1:24 000

MILES

FEET

KILOMETERS

METERS

CONTOUR INTERVAL 10 FEET
SUPPLEMENTARY CONTOUR INTERVAL 5 FEET

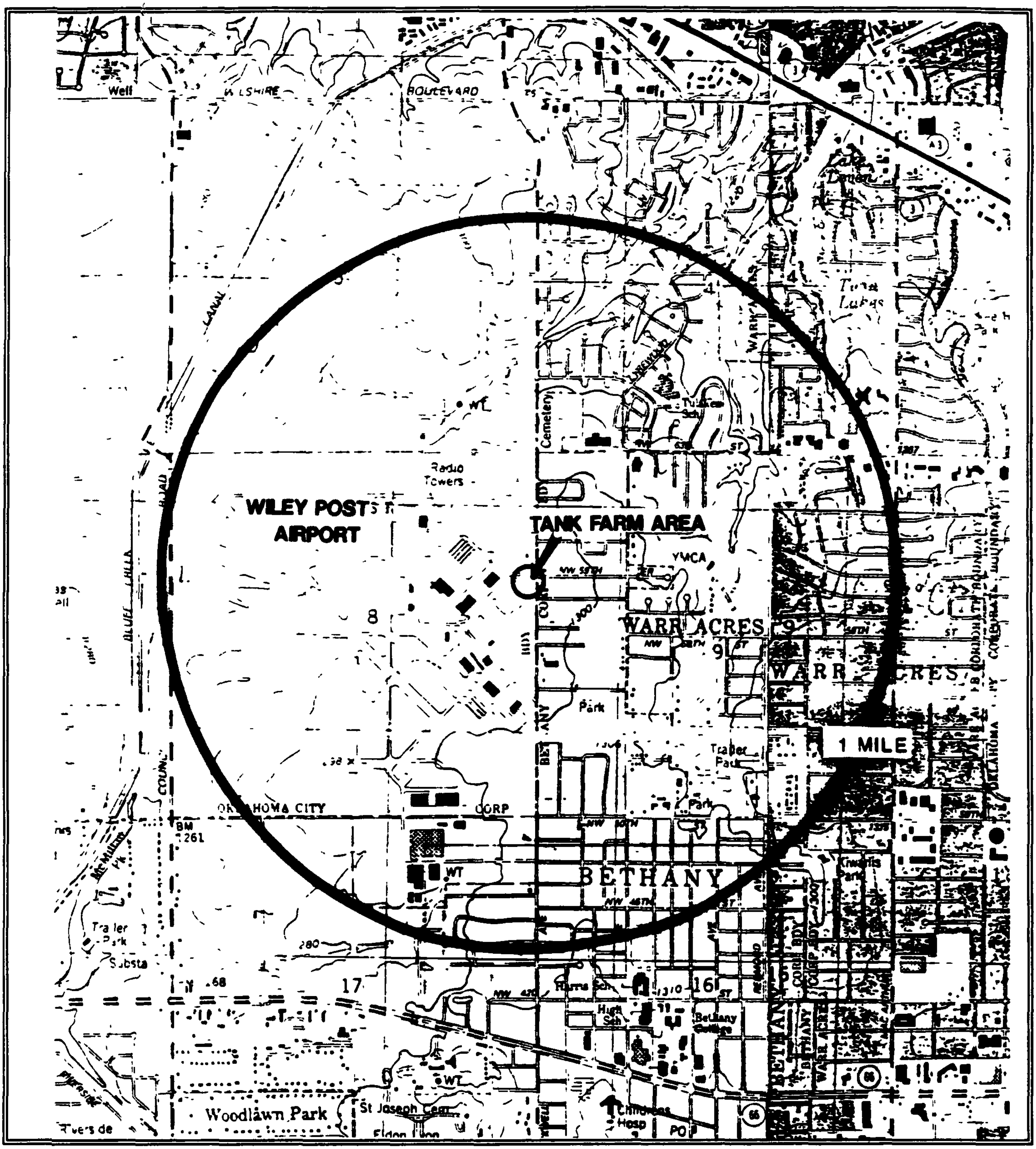
★ MUNICIPAL WELLS OR INTAKES

QUADRANGLE LOCATION

BRITTON, OK	OKLAHOMA CITY, OK
BETHANY, OK	MUSTANG, OK

REFERENCE 1

ICF



N

0 2,000 FT

SCALE 1 : 24,000

FIGURE 1
SITE LOCATION MAP
WILEY POST AIRPORT
BETHANY, OKLAHOMA
OKD987070059

QUADRANGLE LOCATION
BETHANY, OK
BRITTON, OK
OKLAHOMA CITY, OK
MUSTANG, OK

REFERENCE 2

1509 Main Street, Suite 900
Dallas, Texas
75201-4809

214/744-1641

ICF TECHNOLOGY INCORPORATED

TO: Ed Sierra, Region VI, RPO

THRU: K. H. Malone, Jr., FITOM

THRU: Debra R. Pandak, AFITOM

FROM: Robert Taaffe, FIT Chemist Robert Taaffe   TDD: F-06-9002-19

DATE: August 22, 1990   PAN: FOK0346PAA

SUBJ: Preliminary Assessment
Wiley Post Airport, Bethany, Oklahoma County, Oklahoma
OKD0987070059

Attached is the Preliminary Assessment Report for the Wiley Post Airport.

REFERENCE 3

TO: FILE

FROM: DON HUDNALL, Jr., FIT TOXICOLOGIST KS for D.H, Sr.

DATE: DECEMBER 3, 1990

SUBJ: WILEY POST AIRPORT, BETHANY, OKLAHOMA. ON-SITE RECONNAISSANCE INSPECTION LOGBOOK. OKD987070059.

The on-site reconnaissance inspection for the Screening Site Inspection was conducted December 3, 1990. The FIT met with representatives of the Wiley Post Airport and the Oklahoma Airport Commission to discuss the removal of several Underground Storage Tanks (USTs) located on airport property. Mr Jim Smith, Chief of Construction, indicated that Techrad Environmental was contracted to do the UST removals. Mr. Smith also indicated that the airport was in the process of purchasing a mobile spill control unit and that one was not yet in place. The USTs are from 25 to 30 years old and had been coated on an irregular basis. Mr. Smith indicated to the FIT that the Wiley Post Airport tanks had not been tested for tightness.

The FIT later met with Mr. Wayne Fuller, Wiley Post Airport Manager. Mr. Fuller indicated that several USTs had been removed and that the Oklahoma State Corporation Commission had the results from soil testing. Mr. Fuller directed the FIT to several areas where UST pulls had been completed. Most areas had been covered by concrete and were now part of parking areas or taxi ways. Mr. Fuller directed the FIT to the Tank Farm consisting of several above ground diesel and automotive fuel tanks and fueling supply valve systems.

Mr. Fuller stated that no more USTs would be installed at the 1,275 acre Wiley Post Airport.

Attachment: Underground Storage Tank Inventory Summary Sheet.

WILEY POST AIRPORT

Underground Storage Tank Inventory Summary Sheet

Facility: Wiley Post Airport
Location: Oklahoma City. Oklahoma
Date: As of October 1990

Tank Number	Tank Location	Map Symbol	Age	Capacity (gallons)	Product Type	Upgrade Year	Action Needed	Recom. Action	Current Status
1	Main Fuel	D	33	15000	100LL	1989	C,S/OF,P	Removal	Tempor. Closure
2	Main Fuel	D	33	15000	100LL	1989	C,S/OF,P	Removal	Tempor. Closure
3	Main Fuel	D	33	15000	100LL	1989	C,S/OF,P	Removal	Tempor. Closure
4	Main Fuel	D	20	15000	100LL	1990	C,S/OF,P	EM,MI,P	In Compliance
5	Main Fuel	D	26	15000	100LL	1989	C,S/OF,P	EM,MI,P	Non Compliance
6	Main Fuel	D	26	15000	100LL	1989	C,S/OF,P	EM,MI,P	Non Compliance
7	Main Fuel	D	20	15000	JET A	1990	C,S/OF,P	EM,MI,P	Tempor. Closure
8	Main Fuel	D	9	15000	JET A	1993	C,S/OF,P	EM,MI,P	Tempor. Closure
9	Main Fuel	D	33	12000	JET A	1989	C,S/OF,P	EM,MI,P	Non Compliance
12	Main Fuel	D	8	15000	JET A	1993	C,S/OF,P	EM,MI,P	In Compliance
13	Main Fuel	D	5	15000	JET A	1993	C,S/OF,P	EM,MI,P	In Compliance
14	Main Fuel	D	5	15000	JET A	1993	C,S/OF,P	EM,MI,P	In Compliance
17	Main Fuel	D	5	15000	JET A	1993	C,S/OF,P	EM,MI,P	In Compliance
20	Main Fuel	D	UK	3000	UL	1989	C,S/OF,P	Removal	Non Compliance
23	Main Fuel	D	UK	8000	D	1989	C,S/OF,P	Removal	Non Compliance
1	Triton Air	N/A	UK	2000	UL	1989	C,S/OF,P	Removal	Non Compliance
2	Triton Air	N/A	UK	500	W/O	1989	C,S/OF,P	Removal	Non Compliance
1	Hanger 4	4	UK	1000	UL	1989	N/A	N/A	Permnt Closure
2	Hanger 4	4	UK	300	W/O	1989	N/A	N/A	Permnt Closure
1	Hanger 6	6	UK	500	W/O	1989	C,S/OF,P	Removal	Non Compliance

Protection Codes

C= Corrosion
S/OF=Spill/Overfill
P= piping leak detection
TT= tank "tightness" testing
MI= monthly inventory control
EM= external monitoring
N=None UK=Unknown
E=Exemp N/A= Not Applicable

Petroleum Product Types

R=Regular
UL=Unleaded
SUL= Super Unleaded
D= Diesel
W/O= Waste Oil
JP4;JETA;100LL= Aviation Jet Fuels

Underground Storage Tank Inventory Summary Sheet

Facility: Wiley Post Airport
Location: Oklahoma City, Oklahoma
Date: As of October 1990

Tank Number	Tank Location	Map Symbol	Age	Capacity (gallons)	Product Type	Upgrade Year	Action Needed	Recom. Action	Current Status
1	Hanger 2	2	UK	550	W/O	1989	N/A	N/A	Perment Closure
1	Hanger 3	3	UK	550	W/O	1989	N/A	N/A	Perment Closure
1	Hanger 3A	3	UK	1000	UL	1989	N/A	N/A	Perment Closure
1	Hanger 3C	3C	UK	550	W/O	1989	N/A	N/A	Perment Closure
1	Hanger 8	8	UK	500	W/O	1989	N/A	N/A	Perment Closure
1	Hanger 9	9	UK	4000	UL	1989	N/A	N/A	Perment Closure
1	GulfStream Aero.	near 10	21	1000	UL	1990	C,S/OF,P	EM,MI,P	In Compliance
2	GulfStream Aero.	near 10	15	1000	D	1992	C,S/OF,P	EM,MI,P	In Compliance
3	GulfStream Aero.	near 10	15	20000	JET	1992	C,S/OF,P	EM,MI,P	In Compliance
4	GulfStream Aero.	near 10	15	10000	JET	1992	C,S/OF,P	EM,MI,P	In Compliance
5	GulfStream Aero.	near 10	26	3000	Empty	1989	N/A	N/A	Perment Closure
6	GulfStream Aero.	near 10	26	3000	Empty	1989	N/A	N/A	Perment Closure
7	GulfStream Aero.	near 10	27	10000	Empty	1989	N/A	N/A	Perment Closure

Protection Codes
C= Corrosion
S/OF=Spill/Overfill
P= piping leak detection
TT= tank "tightness" testing
MI= monthly inventory control
EM= external monitoring
N=None UK=Unknown
E=Exemp N/A= Not Applicable

Petroleum Product Types
R=Regular
UL=Unleaded
SUL= Super Unleaded
D= Diesel
W/O= Waste Oil
JP4;JETA;100LL= Aviation Jet Fuels

Description of Underground Storage Tanks

Airport: Wiley Post Airport
Location: Main Fuel Supply Depot
Date: Oct-90

	Tank No. 1	Tank No. 2	Tank No. 3	Tank No. 4	Tank No. 5	Tank No. 6
Status of Tank						
Currently in Use				x	x	x
Temporarily Out of Use	x	x	x			
Permanently Out of Use						
In Use ater 5/8/86						
Estimated Age	33	33	33	20	26	26
Estimated Capacity	15000	15000	15000	15000	15000	15000
Construction Materials						
Steel	x	x	x	x	x	x
Concrete						
Fiberglass (FRP)						
Unknown						
Other						
Internal Protection						
Cathodic						
Interior Lining	x	x	x	x	x	x
None						
Unknown						
Other						
External Protection						
Cathodic						
Painted (Asphaltic)	x	x	x	x	x	x
Fiberglass (FRP) coat						
None						
Other						
Piping						
Bare Steel	x	x	x	x	x	x
Galvanized Steel						
Fiberglass (FRP)						
Cathodic Protected						
Unknown						
Other						
Substance Last Stored						
A. Empty						
B. Petroleum						
Diesel						
Kerosene						
Gasoline						
Used Oil						
Other	100LL	100LL	100LL	100LL	100LL	100LL
C. Hazardous Waste						
D. Unknown						
For Tanks Permanently Out-Of-Service						
Estimated Last Use	1984	Jul-90	Jul-90			
Estimated Quantity Left	0	0	0			
Filled with Inert Material						

Description of Underground Storage Tanks

Airport: Wiley Post Airport
Location: Main Fuel Supply Depot
Date: Oct-90

	Tank No. 7	Tank No. 8	Tank No. 9	Tank No. 12	Tank No. 13	Tank No. 14
Status of Tank						
Currently in Use				x	x	x
Temporarily Out of Use	x	x	x			
Permanently Out of Use						
In Use ater 5/8/86						
Estimated Age (years)	20	9	33	8	5	5
Estimated Capacity	15000	15000	12000	15000	15000	15000
Construction Materials						
Steel	x	x	x			
Concrete						
Fiberglass (FRP)				x	x	x
Unknown						
Other						
Internal Protection						
Cathodic						
Interior Lining	x	x	x			
None				x	x	x
Unknown						
Other						
External Protection						
Cathodic						
Painted (Asphaltic)	x	x	x			
Fiberglass (FRP) coat				x	x	x
None						
Other						
Piping						
Bare Steel	x	x	x	x	x	x
Galvanized Steel						
Fiberglass (FRP)						
Cathodic Protected						
Unknown						
Other						
Substance Last Stored						
A. Empty						
B. Petroleum						
Diesel						
Kerosene						
Gasoline						
Used Oil						
Other	JET	JET	JET	100LL	JET	JET
C. Hazardous Waste						
D. Unknown						
For Tanks Permanently Out-Of-Service						
Estimated Last Use						
Estimated Quantity Left						
Filled with Inert Material						

Description of Underground Storage Tanks

Airport: Wiley Post Airport
Location: Main Fuel Supply Depot
Date: Oct-90

	Tank No. 17	Tank No. 20	Tank No. 23
Status of Tank			
Currently in Use	x	x	x
Temporarily Out of Use			
Permanently Out of Use			
In Use ater 5/8/86			
Estimated Age (years)	5	Unknown	Unknown
Estimated Capacity	15000	3000	8000
Construction Materials			
Steel		x	x
Concrete			
Fiberglass (FRP)	x		
Unknown			
Other			
Internal Protection			
Cathodic			
Interior Lining			
None	x	x	x
Unknown			
Other			
External Protection			
Cathodic			
Painted (Asphaltic)		x	x
Fiberglass (FRP) coat	x		
None			
Other			
Piping			
Bare Steel	x	x	x
Galvanized Steel			
Fiberglass (FRP)			
Cathodic Protected			
Unknown			
Other			
Substance Last Stored			
A. Empty			
B. Petroleum			
Diesel			x
Kerosene			
Gasoline		x-UL	
Used Oil			
Other	JET		
C. Hazardous Waste			
D. Unknown			
For Tanks Permanently Out-Of-Service			
Estimated Last Use			
Estimated Quantity Left			
Filled with Inert Material			

Compliance Information Sheet

Tank Nos 1 thru 3
Location Wiley Post Main Fuel Supply
Age 33
Status Temporary Closure

Prevention Equipment & Practices Currently In-Place

	Yes	No
Corrosion Protection		x
Spill/Overfill Prevention		x
Leak Detection		x
Tank "Tightness" Testing		x
Manual Tank Gauging	x	
Automatic Tank Gauging		x
External Monitoring		x

Site Inspection

Ground cover	sod
Visual Contamination	none
Proximity to Ultilities	nearby

EPA Schedule for Phase-In of Release Detection

Year Installed	1989	1990	1991	1992	1993
Unknown	RD	P			
> 1965	RD	P			
'65-'69		P/RD			
'70-'74		P	RD		
'75-'79		P		RD	
'80-'88		P			RD

Shaded area is scheduled phase-in deadline year
P= Release detection for all pressurized piping
RD= Release detection for tanks and suction piping

Compliance Information Sheet

Tank Nos 4
Location Wiley Post Main Fuel Supply
Age 20
Status In Compliance

Prevention Equipment & Practices Currently In-Place

	Yes	No
Corrosion Protection		x
Spill/Overfill Prevention		x
Leak Detection		x
Tank "Tightness" Testing		x
Manual Tank Gauging	x	
Automatic Tank Gauging		x
External Monitoring		x

Site Inspection

Ground cover	sod
Visual Contamination	none
Proximity to Ultilities	nearby

EPA Schedule for Phase-In of Release Detection

Year Installed	1989	1990	1991	1992	1993
Unknown	RD	P			
> 1965	RD	P			
'65-'69		P/RD			
'70-'74		P	RD		
'75-'79		P		RD	
'80-'88		P			RD

Shaded area is scheduled phase-in deadline year
P= Release detection for all pressurized piping
RD= Release detection for tanks and suction piping

Compliance Information Sheet

Tank Nos	5, 6
Location	Wiley Post Main Fuel Supply
Age	26
Status	Non Compliance

Prevention Equipment & Practices Currently In-Place

	Yes	No
Corrosion Protection		x
Spill/Overfill Prevention		x
Leak Detection		x
Tank "Tightness" Testing		x
Manual Tank Gauging	x	
Automatic Tank Gauging		x
External Monitoring		x

Site Inspection

Ground cover	sod
Visual Contamination	none
Proximity to Ultilities	nearby

EPA Schedule for Phase-In of Release Detection

Year Installed	1989	1990	1991	1992	1993
Unknown	RD	P			
> 1965	RD	P			
'65-'69		P/RD			
'70-'74		P	RD		
'75-'79		P		RD	
'80-'88		P			RD

Shaded area is scheduled phase-in deadline year
P= Release detection for all pressurized piping
RD= Release detection for tanks and suction piping

Compliance Information Sheet

Tank Nos 7
Location Wiley Post Main Fuel Supply
Age 20
Status Temporary Clousre

Prevention Equipment & Practices Currently In-Place

	Yes	No
Corrosion Protection		x
Spill/Overfill Prevention		x
Leak Detection		x
Tank "Tightness" Testing		x
Manual Tank Gauging	x	
Automatic Tank Gauging		x
External Monitoring		x

Site Inspection

Ground cover	sod
Visual Contamination	none
Proximity to Ultilities	nearby

EPA Schedule for Phase-In of Release Detection

Year Installed	1989	1990	1991	1992	1993
Unknown	RD	P			
> 1965	RD	P			
'65-'69		P/RD			
'70-'74		P	RD		
'75-'79		P		RD	
'80-'88		P			RD

Shaded area is scheduled phase-in deadline year
P= Release detection for all pressurized piping
RD= Release detection for tanks and suction piping

Compliance Information Sheet

Tank Nos	8
Location	Wiley Post Main Fuel Supply
Age	9
Status	Temporary Closure

Prevention Equipment & Practices Currently In-Place

	Yes	No
Corrosion Protection		x
Spill/Overfill Prevention		x
Leak Detection		x
Tank "Tightness" Testing		x
Manual Tank Gauging	x	
Automatic Tank Gauging		x
External Monitoring		x

Site Inspection

Ground cover	sod
Visual Contamination	none
Proximity to Ultilities	nearby

EPA Schedule for Phase-In of Release Detection

Year Installed	1989	1990	1991	1992	1993
Unknown	RD	P			
> 1965	RD	P			
'65-'69		P/RD			
'70-'74		P	RD		
'75-'79		P		RD	
'80-'88		P			RD

Shaded area is scheduled phase-in deadline year.
P= Release detection for all pressurized piping
RD= Release detection for tanks and suction piping

Compliance Information Sheet

Tank Nos	9
Location	Wiley Post Main Fuel supply
Age	33
Status	Non Compliance

Prevention Equipment & Practices Currently In-Place

	Yes	No
Corrosion Protection		x
Spill/Overfill Prevention		x
Leak Detection		x
Tank "Tightness" Testing		x
Manual Tank Gauging	x	
Automatic Tank Gauging		x
External Monitoring		x

Site Inspection

Ground cover	sod
Visual Contamination	none
Proximity to Ultilities	nearby

EPA Schedule for Phase-In of Release Detection

Year Installed	1989	1990	1991	1992	1993
Unknown	RD	P			
> 1965	RD	P			
'65-'69		P/RD			
'70-'74		P	RD		
'75-'79		P		RD	
'80-'88		P			RD

Shaded area is scheduled phase-in deadline year

P= Release detection for all pressurized piping

RD= Release detection for tanks and suction piping

Compliance Information Sheet

Tank Nos 12
Location Wiley Post Main Fuel Supply
Age 8
Status In Compliance

Prevention Equipment & Practices Currently In-Place

	Yes	No
Corrosion Protection		x
Spill/Overfill Prevention		x
Leak Detection		x
Tank "Tightness" Testing		x
Manual Tank Gauging	x	
Automatic Tank Gauging		x
External Monitoring		x

Site Inspection

Ground cover	sod
Visual Contamination	none
Proximity to Ultilities	nearby

EPA Schedule for Phase-In of Release Detection

Year Installed	1989	1990	1991	1992	1993
Unknown	RD	P			
> 1965	RD	P			
'65-'69		P/RD			
'70-'74		P	RD		
'75-'79		P		RD	
'80-'88		P			RD

Shaded area is scheduled phase-in deadline year
P= Release detection for all pressurized piping
RD= Release detection for tanks and suction piping

Compliance Information Sheet

Tank Nos 13, 14, 17
Location Wiley Post Main Fuel Supply
Age 5
Status In Compliance

Prevention Equipment & Practices Currently In-Place

	Yes	No
Corrosion Protection	x	
Spill/Overfill Prevention		x
Leak Detection		x
Tank "Tightness" Testing		x
Manual Tank Gauging	x	
Automatic Tank Gauging		x
External Monitoring		x

Site Inspection

Ground cover	sod
Visual Contamination	none
Proximity to Ultilities	nearby

EPA Schedule for Phase-In of Release Detection

Year Installed	1989	1990	1991	1992	1993
Unknown	RD	P			
> 1965	RD	P			
'65-'69		P/RD			
'70-'74		P	RD		
'75-'79		P		RD	
'80-'88		P			RD

Shaded area is scheduled phase-in deadline year
P= Release detection for all pressurized piping
RD= Release detection for tanks and suction piping

Compliance Information Sheet

Tank Nos 20, 23
Location Wiley Post Main Fuel Supply
Age UK
Status Non Compliance

Prevention Equipment & Practices Currently In-Place

	Yes	No
Corrosion Protection		x
Spill/Overfill Prevention		x
Leak Detection		x
Tank "Tightness" Testing		x
Manual Tank Gauging		x
Automatic Tank Gauging		x
External Monitoring		x

Site Inspection

Ground cover	sod
Visual Contamination	none
Proximity to Ultilities	nearby

EPA Schedule for Phase-In of Release Detection

Year Installed	1989	1990	1991	1992	1993
Unknown	RD	P			
> 1965	RD	P			
'65-'69		P/RD			
'70-'74		P	RD		
'75-'79		P		RD	
'80-'88		P			RD

Shaded area is scheduled phase-in deadline year
P= Release detection for all pressurized piping
RD= Release detection for tanks and suction piping

Description of Underground Storage Tanks

Airport; Wiley Post Airport
Location: Hanger Facilities
Date: Oct-90

	Tank No. Hanger 2	Tank No. Hanger 3	Tank No. Hanger 3A	Tank No. Hanger 3C	Tank No. Hanger 4	Tank No. Hanger 4
Status of Tank						
Currently in Use						
Temporarily Out of Use						
Permanently Out of Use	x	x	x	x	x	x
In Use ater 5/8/86						
Estimated Age (years)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Estimated Capacity	550	550	100	550	1000	300
Construction Materials						
Steel	x	x	x	x	x	x
Concrete						
Fiberglass (FRP)						
Unknown						
Other						
Internal Protection						
Cathodic						
Interior Lining						
None						
Unknown	x	x	x	x	x	x
Other						
External Protection						
Cathodic						
Painted (Asphaltic)						
Fiberglass (FRP) coat						
None	x	x	x	x	x	x
Other						
Piping						
Bare Steel	x	x	x	x	x	x
Galvanized Steel						
Fiberglass (FRP)						
Cathodic Protected						
Unknown						
Other						
Substance Last Stored						
A. Empty						
B. Petroleum						
Diesel						
Kerosene						
Gasoline			x-UL		x-UL	
Used Oil	x	x		x		x
Other						
C. Hazardous Waste						
D. Unknown						
For Tanks Permanently Out-Of-Service						
Estimated Last Use	Feb-90	Feb-90	Feb-90	Nov-89	Nov-89	Nov-89
Estimated Quantity Left	0	0	0	0	0	0
Filled with Inert Material						

Description of Underground Storage Tanks

Airport: Wiley Post Airport
Location: Hanger Facilities
Date: Oct-90

	Tank No. Hanger 6	Tank No. Hanger 8	Tank No. Hanger 9
Status of Tank			
Currently in Use	x		
Temporarily Out of Use			
Permanently Out of Use		x	x
In Use ater 5/8/86			
Estimated Age (years)	Unknown	Unknown	Unknown
Estimated Capacity	500	500	4000
Construction Materials			
Steel	x	x	x
Concrete			
Fiberglass (FRP)			
Unknown			
Other			
Internal Protection			
Cathodic			
Interior Lining			
None	x	x	x
Unknown			
Other			
External Protection			
Cathodic			
Painted (Asphaltic)			
Fiberglass (FRP) coat			
None	x	x	x
Other			
Piping			
Bare Steel	x	x	x
Galvanized Steel			
Fiberglass (FRP)			
Cathodic Protected			
Unknown			
Other			
Substance Last Stored			
A. Empty		x	x
B. Petroleum			
Diesel			
Kerosene			
Gasoline			x
Used Oil	x	x	
Other			
C. Hazardous Waste			
D. Unknown			
For Tanks Permanently Out-Of-Service			
Estimated Last Use		Apr-90	Apr-90
Estimated Quantity Left		0	0
Filled with Inert Material			

Compliance Information Sheet

Tank Nos	Hanger 2, 3, 3A, 3C, 6
Location	Wiley Post Hanger facilities
Age	UK
Status	Permanent Closure

Prevention Equipment & Practices Currently In-Place

	Yes	No
Corrosion Protection		N/A
Spill/Overfill Prevention		N/A
Leak Detection		N/A
Tank "Tightness" Testing		N/A
Manual Tank Gauging		N/A
Automatic Tank Gauging		N/A
External Monitoring		N/A

Site Inspection

Ground cover	concrete
Visual Contamination	none
Proximity to Ultilities	distant

EPA Schedule for Phase-In of Release Detection

Year Installed	1989	1990	1991	1992	1993
Unknown	RD	P			
> 1965	RD	P			
'65-'69		P/RD			
'70-'74		P	RD		
'75-'79		P		RD	
'80-'88		P			RD

Shaded area is scheduled phase-in deadline year

P= Release detection for all pressurized piping

RD= Release detection for tanks and suction piping

Compliance Information Sheet

Tank Nos Hanger 4-(1,2); Hanger 8, 9
Location Hanger facilities
Age UK
Status Permanent Closure

Prevention Equipment & Practices Currently In-Place

	Yes	No
Corrosion Protection		N/A
Spill/Overfill Prevention		N/A
Leak Detection		N/A
Tank "Tightness" Testing		N/A
Manual Tank Gauging		N/A
Automatic Tank Gauging		N/A
External Monitoring		

Site Inspection

Ground cover	sod
Visual Contamination	none
Proximity to Ultilities	nearby

EPA Schedule for Phase-In of Release Detection

Year Installed	1989	1990	1991	1992	1993
Unknown	RD	P			
> 1965	RD	P			
'65-'69		P/RD			
'70-'74		P	RD		
'75-'79		P		RD	
'80-'88		P			RD

Shaded area is scheduled phase-in deadline year
P= Release detection for all pressurized piping
RD= Release detection for tanks and suction piping

Description of Underground Storage Tanks

Airport:	Wiley Post Airport	
Location:	Triton Jet Away	
Date:	Oct-90	
	Tank No. 1	Tank No. 2
Status of Tank		
Currently in Use	x	x
Temporarily Out of Use		
Permanently Out of Use		
In Use ater 5/8/86		
Estimated Age (years)	Unknown	Unknown
Estimated Capacity	2000	500
Construction Materials		
Steel	x	x
Concrete		
Fiberglass (FRP)		
Unknown		
Other		
Internal Protection		
Cathodic		
Interior Lining		
None		
Unknown	x	x
Other		
External Protection		
Cathodic		
Painted (Asphaltic)		
Fiberglass (FRP) coat		
None	x	x
Other		
Piping		
Bare Steel	x	x
Galvanized Steel		
Fiberglass (FRP)		
Cathodic Protected		
Unknown		
Other		
Substance Last Stored		
A. Empty		
B. Petroleum		
Diesel		
Kerosene		
Gasoline	x-UL	
Used Oil		x
Other		
C. Hazardous Waste		
D. Unknown		
For Tanks Permanently Out-Of-Service		
Estimated Last Use		
Estimated Quantity Left		
Filled with Inert Material		

Compliance Information Sheet

Tank Nos 1, 2
Location Wiley Post Triton Jet Away
Age UK
Status Non Compliance

Prevention Equipment & Practices Currently In-Place

	Yes	No
Corrosion Protection		x
Spill/Overfill Prevention		x
Leak Detection		x
Tank "Tightness" Testing		x
Manual Tank Gauging		x
Automatic Tank Gauging		x
External Monitoring		x

Site Inspection

Ground cover	sod
Visual Contamination	none
Proximity to Ultilities	nearby

EPA Schedule for Phase-In of Release Detection

Year Installed	1989	1990	1991	1992	1993
Unknown	RD	P			
> 1965	RD	P			
'65-'69		P/RD			
'70-'74		P	RD		
'75-'79		P		RD	
'80-'88		P			RD

Shaded area is scheduled phase-in deadline year
P= Release detection for all pressurized piping
RD= Release detection for tanks and suction piping

Description of Underground Storage Tanks

Airport: Wiley Post Airport
Location: Gulfstream Aerospace
Date: Oct-90

	Tank No. 1	Tank No. 2	Tank No. 3	Tank No. 4	Tank No. 5	Tank No. 6
Status of Tank						
Currently in Use	x	x	x	x		
Temporarily Out of Use						
Permanently Out of Use					x	x
In Use ater 5/8/86						
Estimated Age (years)	20	14	14	14	25	25
Estimated Capacity	1000	1000	20000	10000	3000	3000
Construction Materials						
Steel	x	x	x	x	x	x
Concrete						
Fiberglass (FRP)						
Unknown						
Other						
Internal Protection						
Cathodic						
Interior Lining						
None						
Unknown	x	x	x	x	x	x
Other						
External Protection						
Cathodic						
Painted (Asphaltic)	x	x	x	x	x	x
Fiberglass (FRP) coat						
None						
Other						
Piping						
Bare Steel	x	x	x	x	x	x
Galvanized Steel						
Fiberglass (FRP)						
Cathodic Protected						
Unknown						
Other						
Substance Last Stored						
A. Empty					x	x
B. Petroleum						
Diesel		x				
Kerosene						
Gasoline	x-UL					
Used Oil						
Other			JET	JET		
C. Hazardous Waste						
D. Unknown						
For Tanks Permanently Out-Of-Service						
Estimated Last Use					Jun-75	Jun-75
Estimated Quantity Left					0	0
Filled with Inert Material						

Airport: Wiley Post Airport
Location: Gulfstream Aerospace
Date: Oct-90

	Tank No. 7
Status of Tank	
Currently in Use	
Temporarily Out of Use	
Permanently Out of Use	x
In Use ater 5/8/86	
Estimated Age (years)	23
Estimated Capacity	10000
Construction Materials	
Steel	x
Concrete	
Fiberglass (FRP)	
Unknown	
Other	
Internal Protection	
Cathodic	
Interior Lining	
None	
Unknown	x
Other	
External Protection	
Cathodic	
Painted (Asphaltic)	x
Fiberglass (FRP) coat	
None	
Other	
Piping	
Bare Steel	
Galvanized Steel	x
Fiberglass (FRP)	
Cathodic Protected	
Unknown	
Other	
Substance Last Stored	
A. Empty	x
B. Petroleum	
Diesel	
Kerosene	
Gasoline	
Used Oil	
Other	
C. Hazardous Waste	
D. Unknown	
For Tanks Permanently Out-Of-Service	
Estimated Last Use	Apr-68
Estimated Quantity Left	0
Filled with Inert Material	x

Compliance Information Sheet

Tank Nos 1
Location Wiley Post Gulfstream Aerospace
Age 21
Status In Compliance

Prevention Equipment & Practices Currently In Place

	Yes	No
Corrosion Protection		x
Spill/Overfill Prevention		x
Leak Detection		x
Tank "Tightness" Testing		x
Manual Tank Gauging		x
Automatic Tank Gauging		x
External Monitoring		x

Site Inspection

Ground cover	concrete
Visual Contamination	none
Proximity to Ultilities	unknown

EPA Schedule for Phase-In of Release Detection

Year Installed	1989	1990	1991	1992	1993
Unknown	RD	P			
> 1965	RD	P			
'65-'69		P/RD			
'70-'74		P	RD		
'75-'79		P		RD	
'80-'88		P			RD

Shaded area is scheduled phase-in deadline year
P= Release detection for all pressurized piping
RD= Release detection for tanks and suction piping

Compliance Information Sheet

Tank Nos 2 thru 4
Location Wiley Post Gulfstream Aerospace
Age 14
Status In Compliance

Prevention Equipment & Practices Currently In-Place

	Yes	No
Corrosion Protection		x
Spill/Overfill Prevention		x
Leak Detection		x
Tank "Tightness" Testing		x
Manual Tank Gauging		x
Automatic Tank Gauging		x
External Monitoring		x

Site Inspection

Ground cover	concrete
Visual Contamination	none
Proximity to Ultilities	unknown

EPA Schedule for Phase-In of Release Detection

Year Installed	1989	1990	1991	1992	1993
Unknown	RD	P			
> 1965	RD	P			
'65-'69		P/RD			
'70-'74		P	RD		
'75-'79		P		RD	
'80-'88		P			RD

Shaded area is scheduled phase-in deadline year
P= Release detection for all pressurized piping
RD= Release detection for tanks and suction piping

Compliance Information Sheet

Tank Nos 5, 6, 7
Location Wiley Post Gulfstream Aerospace
Age 25, 25, 23
Status Permanent Closure

Prevention Equipment & Practices Currently In-Place

	Yes	No
Corrosion Protection		N/A
Spill/Overfill Prevention		N/A
Leak Detection		N/A
Tank "Tightness" Testing		N/A
Manual Tank Gauging		N/A
Automatic Tank Gauging		N/A
External Monitoring		N/A

Site Inspection

Ground cover	concrete
Visual Contamination	none
Proximity to Ultilities	unknown

EPA Schedule for Phase-In of Release Detection

Year Installed	1989	1990	1991	1992	1993
Unknown	RD	P			
> 1965	RD	P			
'65-'69		P/RD			
'70-'74		P	RD		
'75-'79		P		RD	
'80-'88		P			RD

Shaded area is scheduled phase-in deadline year
P= Release detection for all pressurized piping
RD= Release detection for tanks and suction piping

REFERENCE 4

DOCUMENTATION REPORT

ON AN

UNDERGROUND STORAGE TANK

REMOVAL

WILEY POST AIRPORT

5500 N. ROCKWELL

OKLAHOMA CITY

Prepared by

Petroleum Marketers Equipment Co.

2010 Exchange Ave.

Oklahoma City, Oklahoma 73108

November 17, 1989

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DOCUMENTATION REPORT ON AN UNLEADED
UNDERGROUND STORAGE TANK REMOVAL
WILEY POST AIRPORT, HANGER 3 and 4
OKLAHOMA CITY, OKLAHOMA

1.0 INTRODUCTION

Atlas Paving contracted Petroleum Marketers Equipment Co. (PMECO) to remove three underground storage tank's (UST's) at Wiley Post Airport located in Oklahoma County Section 8 of Township 12N, Range 4W, Oklahoma City (5500 NW 55th). Oklahoma City Airport Authority chose to remove the tanks because they where no longer needed. On November 9, 1989 a 550 gallon waste/oil tank was removed at Hanger 3 and a 1000 gallon unlead and 300 gallon waste/oil were removed from Hanger 4. The unleaded UST tank had previously been used for fueling of company vehicles and waste/oil tanks were utilized by the leasing companies for disposal of used motor oil. On November 10, 1989 Wes Anderson, Petroleum Marketers Equipment Company's Environmental Specialist conducted a site assessment of the excavation areas.

Waste Oil tank excavation located at the Southeast end of Hanger 3 showed to be below detectable levels for total petroleum hydrocarbons lab analysis. Hanger 4 where the 1000 gallon Unlead and 300 gallon waste/oil tanks were removed showed high concentrations of hydrocarbons. Lab analysis showed the two sites at Hanger 4 to be above limits and corrective action would be necessary.

Heidi Falk with C.H. Guernsey, representing the Oklahoma City Airport Authority, then requested Wes Anderson with PMECO to perform a preliminary site assessment of the property to determine the possible extent of the contamination. A total of eight (8) soil borings were drilled and samples were taken of the groundwater encountered.

A meeting with Mike Browsey with The Oklahoma Water Resources Board, Wes Anderson with Petroleum Marketers Equipment Co., Greg Wagner with Techrad Environmental, and representatives of The Oklahoma City Airport Authority was held at the location. Mr. Browsey was informed of what was found and that further investigation would be conducted by a subcontractor hired by The Oklahoma City Airport Authority.

2.0 DOCUMENTATION OF UST REMOVAL

2.1 Tank Condition:

Upon removal all UST's were visually inspected by PMECO personnel for signs of corrosion or holes in the tank. The UST's were bare steel. The 550 gallon waste/oil tank at Hanger 3 was in good condition and showed some signs of pitting, but, no holes were discovered. The 300 gallon waste/oil and 1000 gallon unleaded tank removed from Hanger 4 were in poor condition. There were holes up to 1/8 of an inch in both tanks along the bottoms and ends of the tanks.

2.2 Dispenser/Vent Line Condition:

Visual examination of the vent line and dispenser line (including the couplings to the tank) showed these lines to be in fair condition with some corrosion starting. The dispenser line and the vent line were both made of steel. There was evidence of seepage from the lines and dispenser due to staining of the piping and pump on the unlead tank at Hanger 4.

2.3 Product Removal From The UST:

On November 10, 1989, approximately 4 inches of unleaded gasoline was measured in the UST by PMECO personnel. PMECO made arrangements with Oklahoma Tank Service for removal of the fuel and appropriate disposal.
No waste was found in the 300 gallon and 550 gallon tanks.

2.4 Removal of Gasoline Vapors From Tank:

PMECO removed the vapors from the UST's by placing approximately 1.5 pounds per 100 gallons of dry ice (frozen carbon dioxide) in the tanks. The frozen carbon dioxide evolved CO_2 gas as it melted, displacing the gasoline vapors in the tank. All gasoline vapors were displaced to a level well below the lower explosive limit (LEL) as measured on an explosimeter prior to tank removal and transportation for disposal.

2.5 UST Excavation:

Prior to the excavation of the UST, all power sources leading to the tank were identified and disconnected. The UST was excavated and removed using a backhoe. Groundwater was not encountered during the UST excavation.

2.6 UST Disposal:

PMECO (at Atlas Paving's direction) arranged for the disposal of the UST and associated dispenser and vent piping at Saber Steel. Factual documentation of this disposal will come at a later date.

3.0 SITE INVESTIGATION

3.1 Organic Vapor Survey:

PMECO's Environmental Specialist collected soil samples from the UST excavation's after removal ~~of the UST's~~. These soil samples were collected mainly from the sidewalls, and bottom of the tank excavation. During UST excavation, faint gasoline and hydrocarbon odors were detected in the sand backfill adjacent to the UST's at Hanger 4. Because of this, PMECO conducted ambient temperature headspace (ATH) analyses on the soil samples collected from the excavation sidewalls and bottom. The ATH method consists of collecting discreet (or composite) soil samples and placing the soil in a glass container, leaving a vacant headspace in the glass container. The headspace gas in each glass sample container is then analyzed for organic vapors using a portable HNU photoionization detector. The resulting HNU headspace gas reads in parts per million (ppm) to total ionizable hydrocarbon based on a benzene standard. The HNU photoionization detector was calibrated to a known benzene gas prior to the headspace readings. The HNU detector has a limit of detection of 200 parts per billion of total ionizable hydrocarbon. Results of ambient temperature headspace gas readings are recorded on Figure 3, 4 and 5.

Referring to Figure 3, the HNU readings at Hanger 3 indicated only a slight impact above background air. Figure 4 and 5 show extremely high concentrations in the tank excavations. Samples were taken at point of highest HNU reading for lab analysis.

3.2 Product Inventory Records

No inventory records are available for this report.

3.3 Soil Borings

A total of eight (8) soil borings (Figure 2) were drilled on the property for the purpose of evaluating the subsurface stratigraphy/hydrogeology and to delineate the horizontal and vertical extent of gasoline fuel impacts to the subsurface soils/groundwater/utility lines at the site. All eight (8) borings were drilled by Oklahoma Testing Laboratory (Oklahoma City, OK) under the supervision of Petroleum Marketers Equipment Co. (PMECO). Method of drilling utilized was Air Rotary. Drill Rig, Model SS 135 Speedstar. Soil boring depths ranged from 10.5 to 16.0 foot in depth. All borings were drilled through dark brown sandy loam, pale brown gray sand, Red coarse sands, and red siltstone

Soil samples were taken at 5 ft. intervals with a split spoon sampler to total boring depth. Samples were checked with an HNU photoionization detector utilizing the ambient temperature headspace method for hydrocarbons.

3.4 Groundwater Observations

Groundwater was encountered in all soil borings. Average depth below surface, measured after a 24 hour waiting period, 10.1 feet. Water table levels submitted in Table 2. Potentiometric surface found in Figure 6 and 7.

3.5 Soil Vapor Survey

A soil vapor (gas) survey typically is the measurement of relative or specific volatile hydrocarbon concentrations in soil pores in the unsaturated and saturated zone at various points distributed vertically and horizontally. In the unsaturated zone, hydrocarbons can exist in the vapor phase in soil pores, they can be sorbed onto soil particles, and they can exist as free hydrocarbon liquid in soil pores. Hydrocarbons in the saturated zone are typically sorbed onto soil particles over the zone of groundwater fluctuations or may exist as free liquid in the soil pores. By obtaining soil vapor data at vertically and horizontally distributed points, the extent of subsurface hydrocarbon impact can be defined. The ambient temperature headspace method was utilized for the soil vapor survey at the Wiley Airport location. This method consists of collecting discreet (or composite) soil samples from a borehole and placing the soil in a container, leaving a vacant headspace in the container. The headspace gas in each container is then analyzed for organic vapors using a portable HNU photoionization detector approximately 15 minutes later.

Soil samples at the location were collected at 5 foot intervals using a split spoon sampler. Samples were collected over the entire depth of each boring, unless groundwater was encountered. The HNU photoionization detector was used to detect organic vapors. The resulting HNU headspace gas readings are in parts per million (ppm) of total ionizable hydrocarbon based upon a benzene standard. The HNU photoionization detector was calibrated to a known benzene gas standard prior to the headspace gas readings. The HNU detector has a limit of detection of 200 parts per billion of total ionizable hydrocarbon. Results of the HNU ambient temperature headspace gas readings are present in Table 1.

The HNU soil gas readings provide and important insight into both the vertical and horizontal extent of hydrocarbon (gasoline) occurrence in the subsurface soils beneath the subject site.

4.0 RESULTS OF INVESTIGATION

4.1 Site Stratigraphy

The site rest on Terrace deposits a few feet thick which are underlain by rocks of Pennsylvanian and Permian age which dip toward the southwest at about forty (40) feet per mile. Erosion has formed a gently rolling surface in the area. The topography at the sight slopes slightly West and is approximated at about 1350 feet above mean sea level. The nearest surface water is the Lake Hefner Canal estimated to be 1500 feet West of the site.

The location area is underlain by Terrace Deposits of red coarse grain sands about 2 to 5 feet thick followed by the Bison and Salt Plains Formation of the Permian-age Hennessey Group. The Salt Plains Formation is reported in the literature as a red-brown blocky shale and an orange-brown siltstone (Bingham and Moore, 1975). It has a reported thickness of approximately two-hundred (200) feet in the Oklahoma City area. This Formation is underlain by the Kingman Siltstone (thickness approximately thirty (30) feet, which in turn is underlain by the Fairmont shale, thickness approximately thirty (30) feet. The Garber Sandstone underlies the Fairmont Shale, with the top of the sandstone occurring at a depth of approximately 260 feet beneath the site.

The native lithologic units encountered in the upper sixteen (16) feet at the site are of the Dougherty-Norge-Teller association according to the Oklahoma County Soil Survey (Figure 1). The upmost layer of soil ranging from .5 to 3 feet is a dark gray silt loam. The following layer ranges from 3 to 7 feet which consist of dark brown sandy loam. Fine sands to red coarse sands range to the 13 foot level. Underlying this is a weathered orange brown siltstone below the location. This unit has a reported thickness of approximately two-hundred (200) feet (Bingham and Moore, 1975).

4.2 Site Hydrogeology

The Wiley Post location is underlain by approximately 2 to 5 feet of terrace deposits. These deposits overlay the bedrock of the Hennessey Group. According to the Hydrologic Atlas for the Oklahoma City Quadrangle water is available from either of the two aquifers.

Water yields from the terrace deposits depend on the saturated thickness of the area. Yields are greatest along the major rivers where the saturated layers are thickest. The Hennessey Group is not a major water-producing aquifer in this area due to its lithological characteristics. It is composed primarily of low-permeable shales and siltstones. Small quantities of groundwater are typically obtained from this group from the weathered material above the unaltered shales and siltstones. Wells drilled into this group typically yield small quantities of fair to poor quality water.

4.3 Soil Analytical Results

A representative sample of the soil in the excavation area was taken where the highest HNU readings were found, after tank removal had been completed. These samples were sent to Southwell Laboratory and analyzed for B.T.E.X. for the gasoline tank and total petroleum hydrocarbon (T.P.H.) for the waste oil tanks. Results of T.P.H. lab analysis for the waste oil tank at Hanger 3 showed < 10 ppm. T.P.H. and B.T.E.X. analysis for Hanger 4 showed to be above limits for corrective action. Lab Analysis is submitted in Appendix B.

4.4 Product Occurrence In Subsurface

Based upon the HNU head space soil vapor survey, visual soil observations, observations, and lab analysis, it is evident that there was a impact on the subsurface soils and shallow groundwater beneath Hanger 4.

An HNU photoionization detector was utilized for the evaluation of hydrocarbon vapor presence in soil samples collected from the borings. Ambient temperature headspace analyses were performed on soil samples which were taken using a split spoon sampler at five (5) foot intervals from each borehole. Some samples were taken at other intervals depending on the depth of the shallow groundwater. Referring to Table 1, high concentrations of hydrocarbon vapors were detected in soil borings # 1 and 2. The hydrocarbon vapors detected in these soil borings were found down to the shallow groundwater. Highest HNU readings typically were found just above the groundwater. Representative groundwater samples were retrieved from all soil borings. Groundwater samples from soil boring # 1,3,4,6,7, and 8 were sent to Southwell Laboratory for lab analysis. Groundwater retrieved from soil boring # 1 had a slight sheen of gasoline. Soil boring # 1 and 2 had a strong odor of gasoline. Soil boring # 5 had a thin layer of oil floating on the groundwater sample retrieved by clear bailer. Lab analysis showed dissolved gasoline constituents from groundwater samples retrieved from soil boring # 1 and 2. Ground water samples retrieved from all other soil borings were below detectable limits for there particular analysis.

5.0 Remedial Action to Date

5.1 Tank and Product Line Removal

November 10, 1989, Petroleum Marketers Equipment Co. removed three (3) gasoline underground storage tanks:

1 - Five hundred fifty (550) gallon Waste/Oil tank, Hanger 3.

1 - Three hundred (300) gallon Waste/Oil tank, Hanger 4.

1 - One thousand (1000) gallon Unlead tank, Hanger 4.

5.2 Soil Remediation

Petroleum Marketers Equipment Company placed the contaminated soil back in the tank holes at Hanger 4, at the request of The Oklahoma Airport Authority. Visqueen was placed over the tank excavations to prevent water from entering down through the excavated material.

The reason the Airport Authority chose to do this was the concern for the integrity of the building located next to the tank holes.

Mike Browsey, with The Oklahoma Water Resources Board, was informed of the action taken.

6.0 CONCLUSION

From this investigation the following has been concluded:

1) Soils around the unlead tank removed from the area West of Hanger 4 are impacted by gasoline down to the shallow water table.

2) Soils around the 300 gallon waste oil tank removed from the West side of Hanger 4 are impacted by waste

oil. Lab analysis showed no sign of dissolved product in the groundwater. However, observations made of retrieved groundwater from soil boring #5 showed a thin layer of oil.

3) Phase-separated hydrocarbons are present in all soil borings.

4) Phase-separated hydrocarbons have spread across the property on the shallow water table.

All further investigation and remediation will be conducted by The Oklahoma City Airport Authority.

REFERENCES

1. Bingham and Moore, 1975.
   Reconnaissance of the Water Resources of the Oklahoma City Quadrangle, Central Oklahoma;
   Hydrologic Atlas #4, Oklahoma Geological Survey

2. Van Zyl et al, 1987, Geotechnical and Geohydrological Aspects of Waste Management, Lewis Publishers, Inc. page 287-299.

3. United States Department of Agriculture, 1969, Soil Survey, Oklahoma County, Oklahoma; Soil Conservation Service In cooperation with Oklahoma Agricultural Experiment Station.

FIGURES

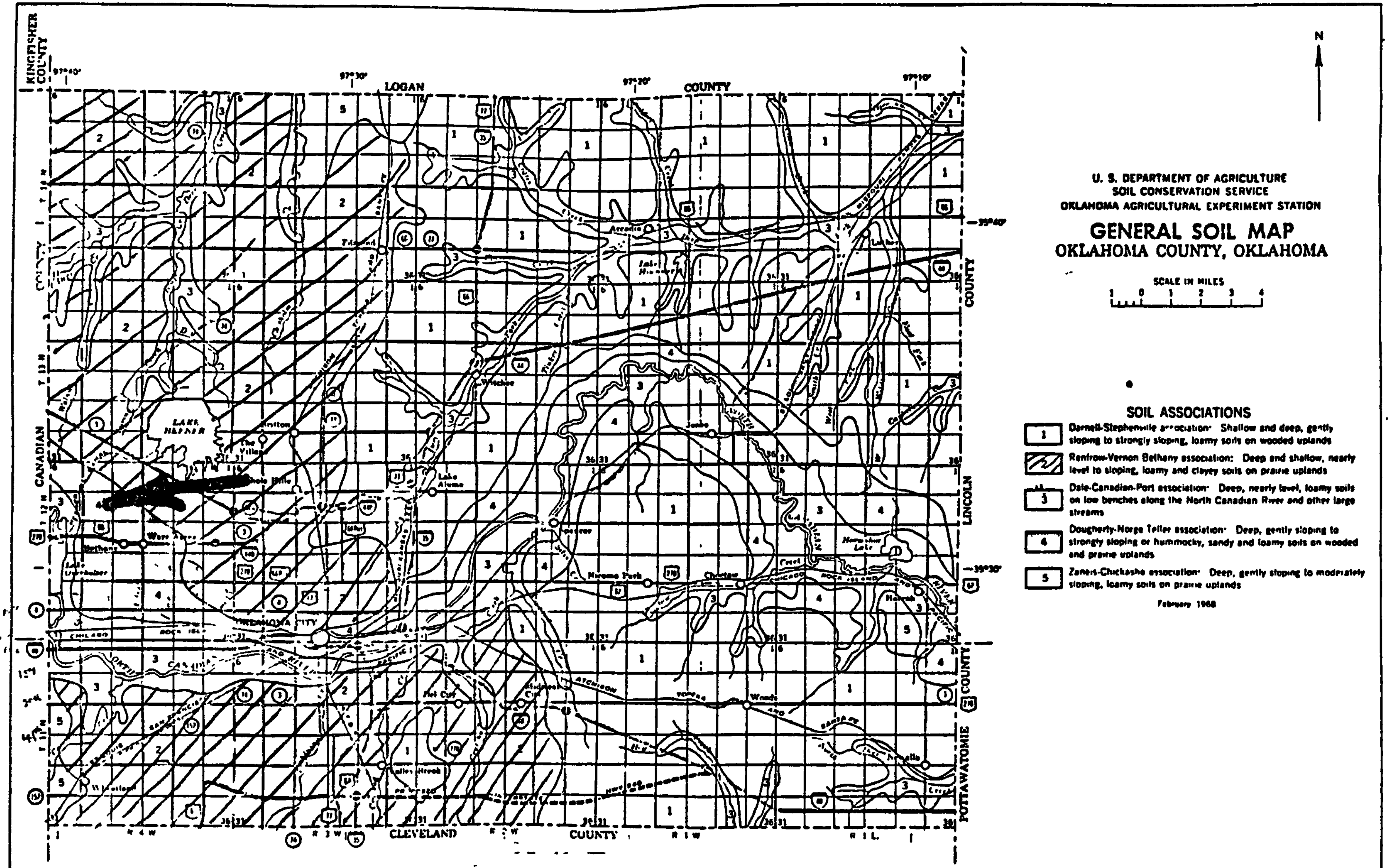

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
OKLAHOMA AGRICULTURAL EXPERIMENT STATION
GENERAL SOIL MAP
OKLAHOMA COUNTY, OKLAHOMA
SCALE IN MILES
SOIL ASSOCIATIONS
1 Darnell-Stephenville association: Shallow and deep, gently sloping to strongly sloping, loamy soils on wooded uplands
2 Renfrow-Vernon Bethany association: Deep and shallow, nearly level to sloping, loamy and clayey soils on prairie uplands
3 Dale-Canadian-Port association: Deep, nearly level, loamy soils on low benches along the North Canadian River and other large streams
4 Dougherty-Norge Teller association: Deep, gently sloping to strongly sloping or hummocky, sandy and loamy soils on wooded and prairie uplands
5 Zaneis-Chickasha association: Deep, gently sloping to moderately sloping, loamy soils on prairie uplands
February 1968
N
LOGAN COUNTY
CLEVELAND COUNTY
LINCOLN COUNTY
POTTAWATOMIE COUNTY
CANADIAN COUNTY
KINGFISHER COUNTY
LAKE HEFNER
OKLAHOMA CITY

Figure 1

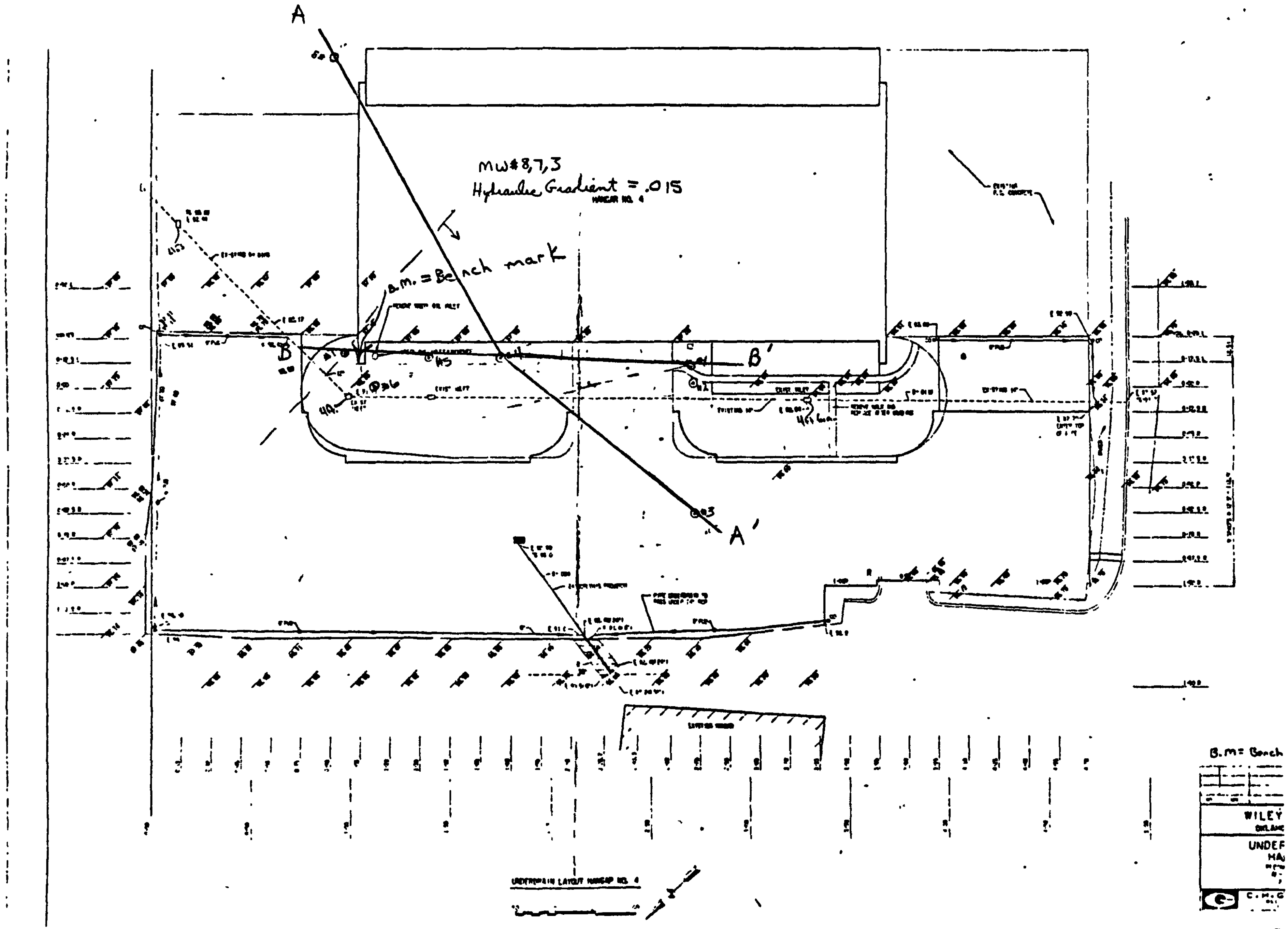

A
A'
B
B'
MW#8,7,3
Hydraulic Gradient = .015
HANGAR NO. 4
B.M. = Bench mark
UNDERDRAIN LAYOUT HANGAR NO. 4
B.M= Bench
WILEY

Figure 2

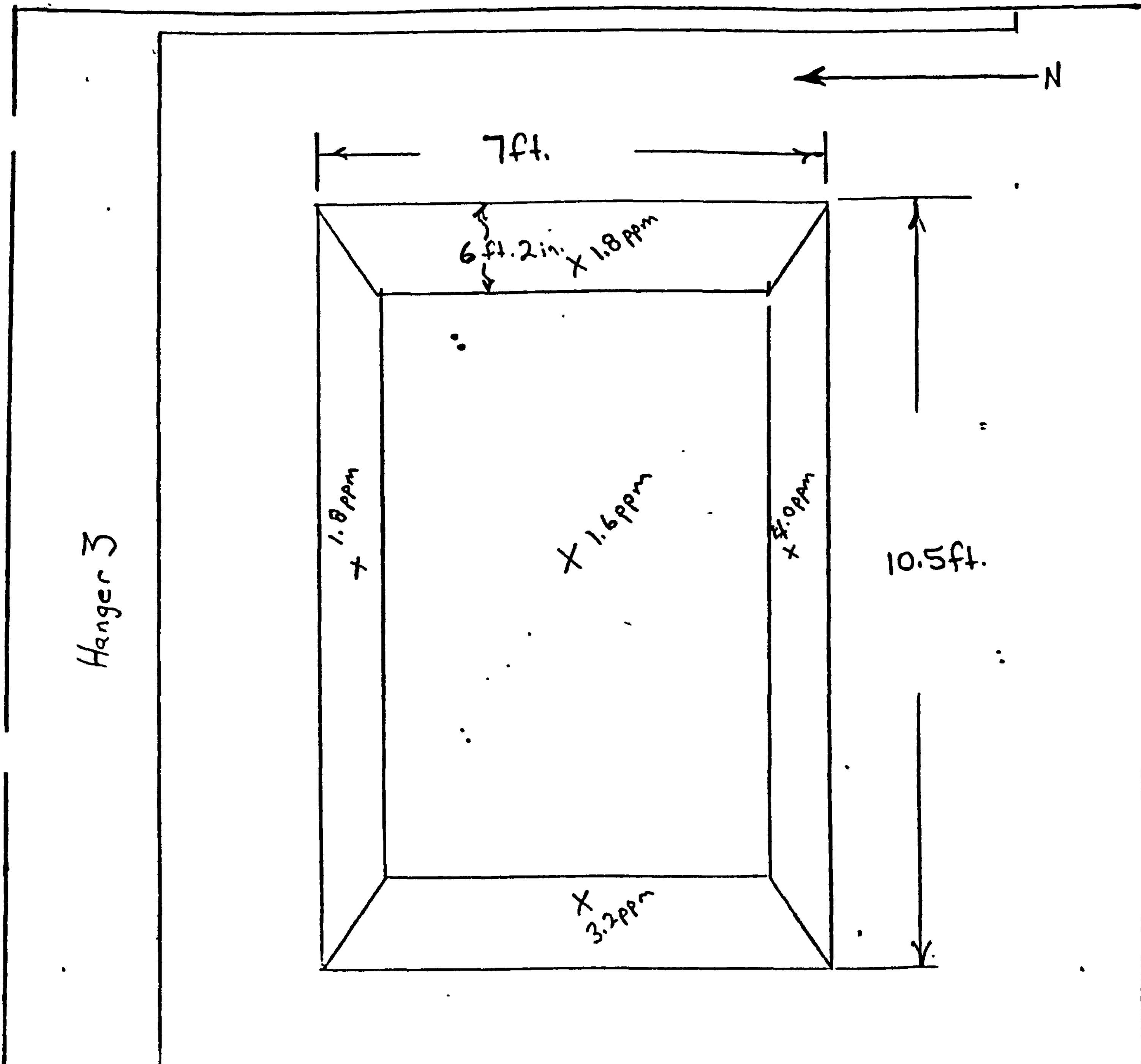


FIGURE TITLE: Figure 3	CLIENT: Atlas Paving
	LOCATION: Wiley Post Airport
COMMENTS: Soil gas sampling sites immediately following waste oil tank removal, hanger 3	PETROLEUM MARKETERS EQUIPMENT CO. 2010 Exchange Ave. OKLAHOMA CITY, OK. 73108 (405) 235-4471
DRAWN BY:	

SUMMARY OF HNU SOIL GAS READINGS, PPM OF TOTAL IONIZABLE HYDROCARBON

SOIL SAMPLES	HNU BACKGROUND AIR	HNU READING
895-066	1.0 ppm	4.0 ppm

NOTE: HNU SOIL GAS READINGS WERE MADE ACCORDING TO THE AMBIENT TEMPERATURE HEADSPACE METHOD.

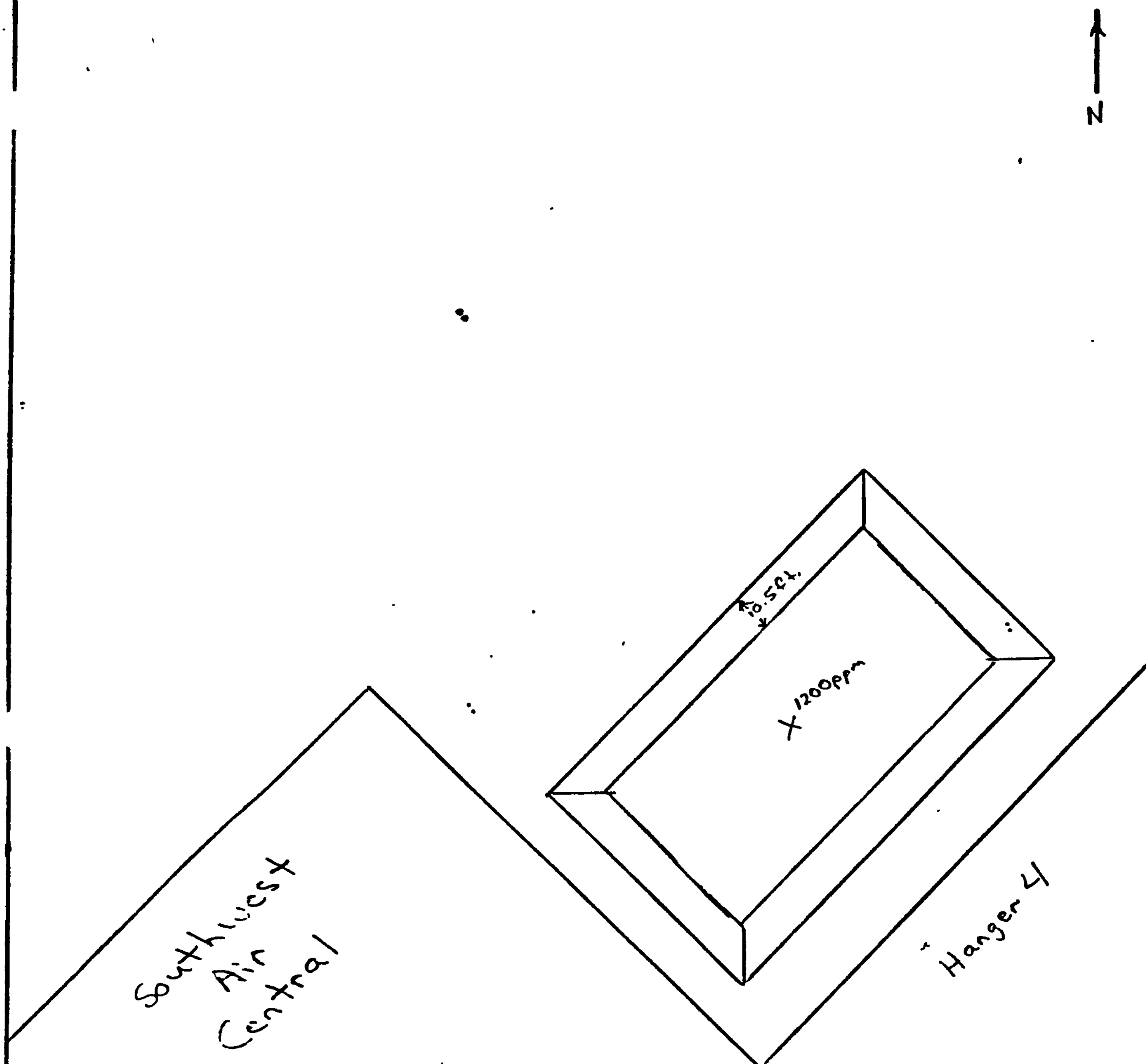


FIGURE TITLE: Figure 4	CLIENT: Atlas Paving
	LOCATION: Wiley Post Airport
COMMENTS: Soil gas sampling sites immediately following unlead U.S.T. removal, hanger 4	PETROLEUM MARKETERS EQUIPMENT CO. 2010 Exchange Ave. OKLAHOMA CITY, OK. 73108 (405) 235-4471
DRAWN BY:	

SUMMARY OF HNU SOIL GAS READINGS, PPM OF TOTAL IONIZABLE HYDROCARBON

SOIL SAMPLES	HNU BACKGROUND AIR	HNU READING
895-100	1.0 ppm	1200 ppm

NOTE: HNU SOIL GAS READINGS WERE MADE ACCORDING TO THE AMBIENT TEMPERATURE HEADSPACE METHOD.

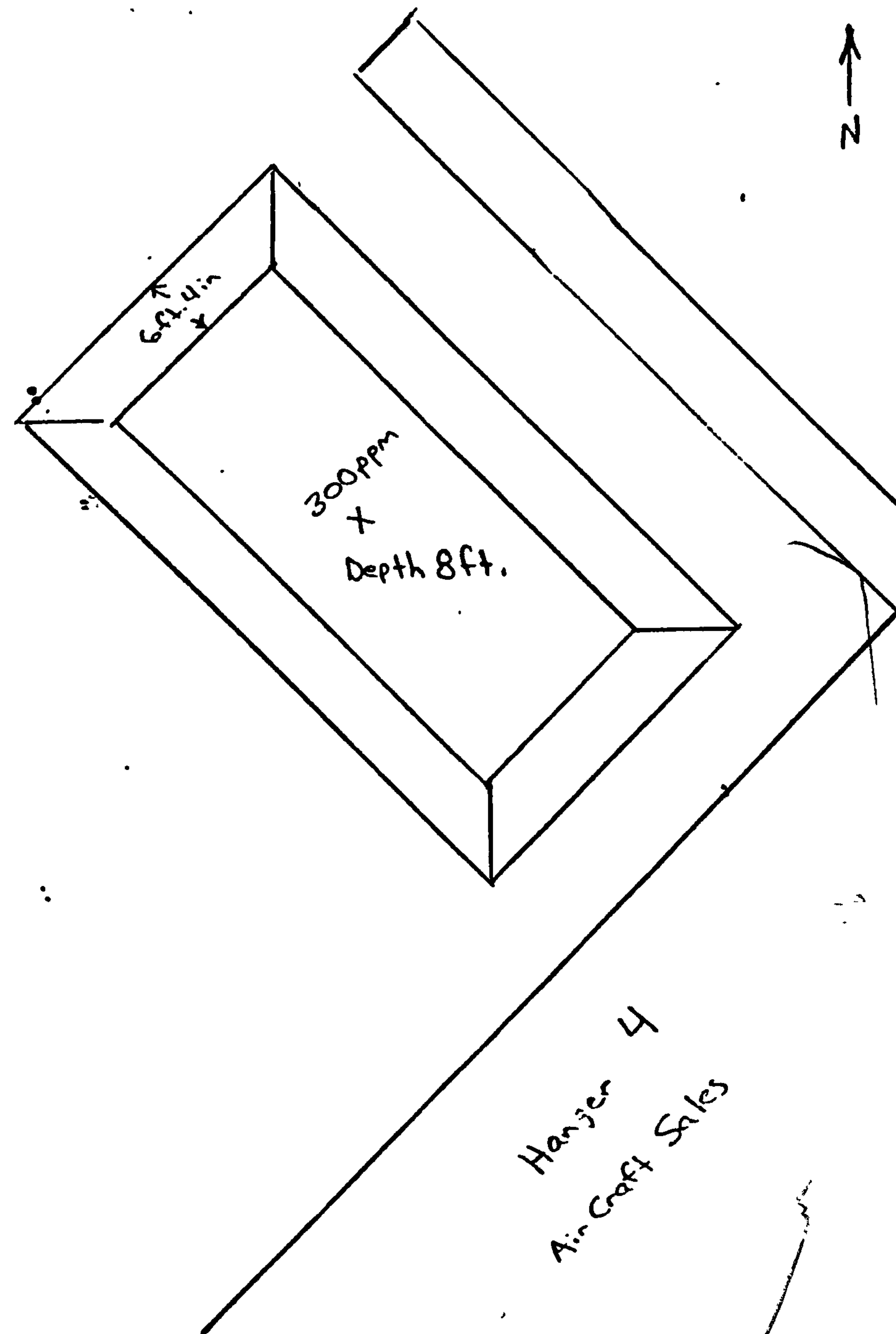
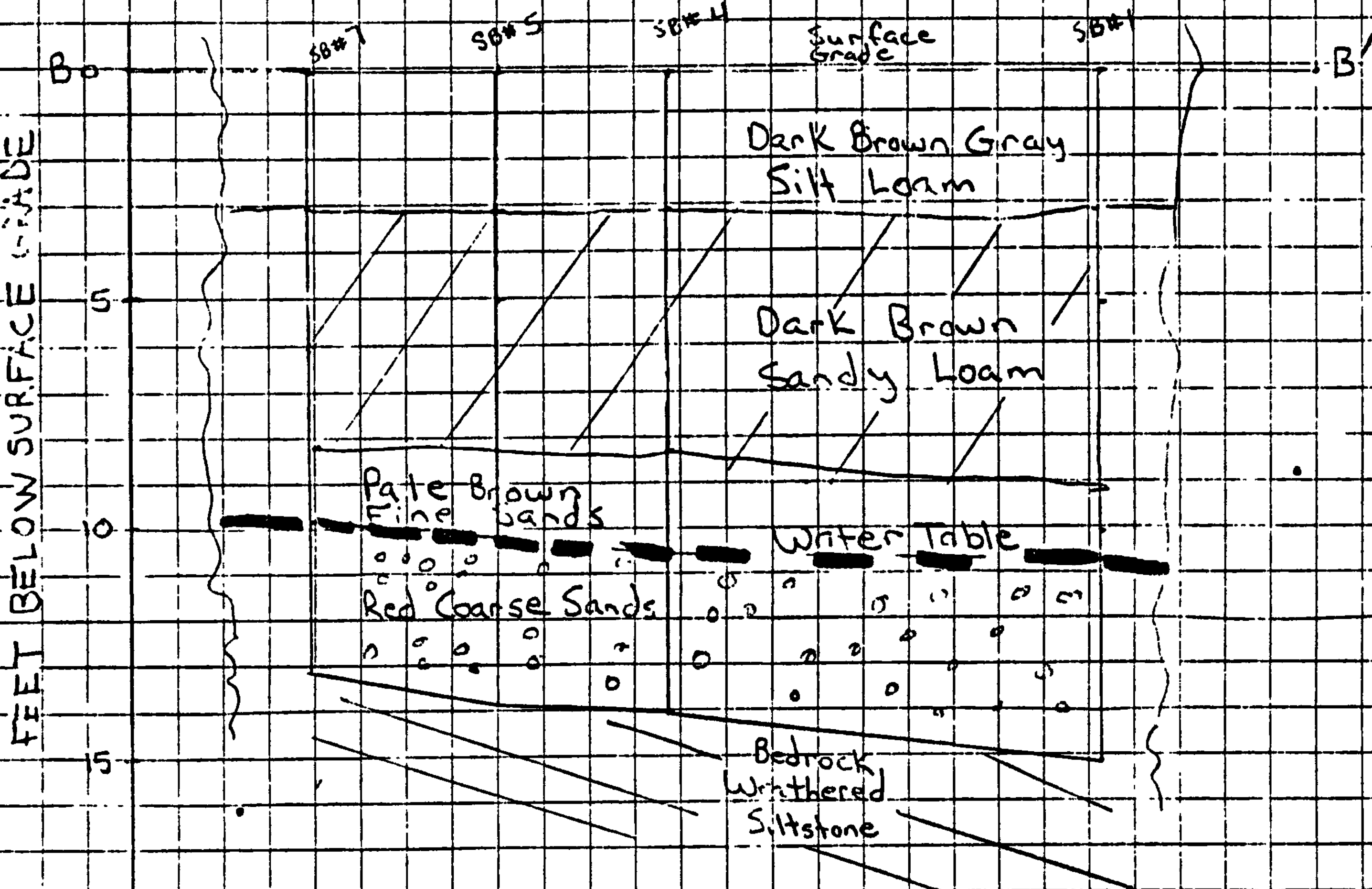


FIGURE TITLE: Figure 5	CLIENT: Atlas Paving LOCATION: Wiley Post Airport
COMMENTS: Soil gas sampling sites immediately following 300 gallon waste oil removal, hanger 4	PETROLEUM MARKETERS EQUIPMENT CO. 2010 Exchange Ave. OKLAHOMA CITY, OK. 73108 (405) 235-4471
DRAWN BY:	

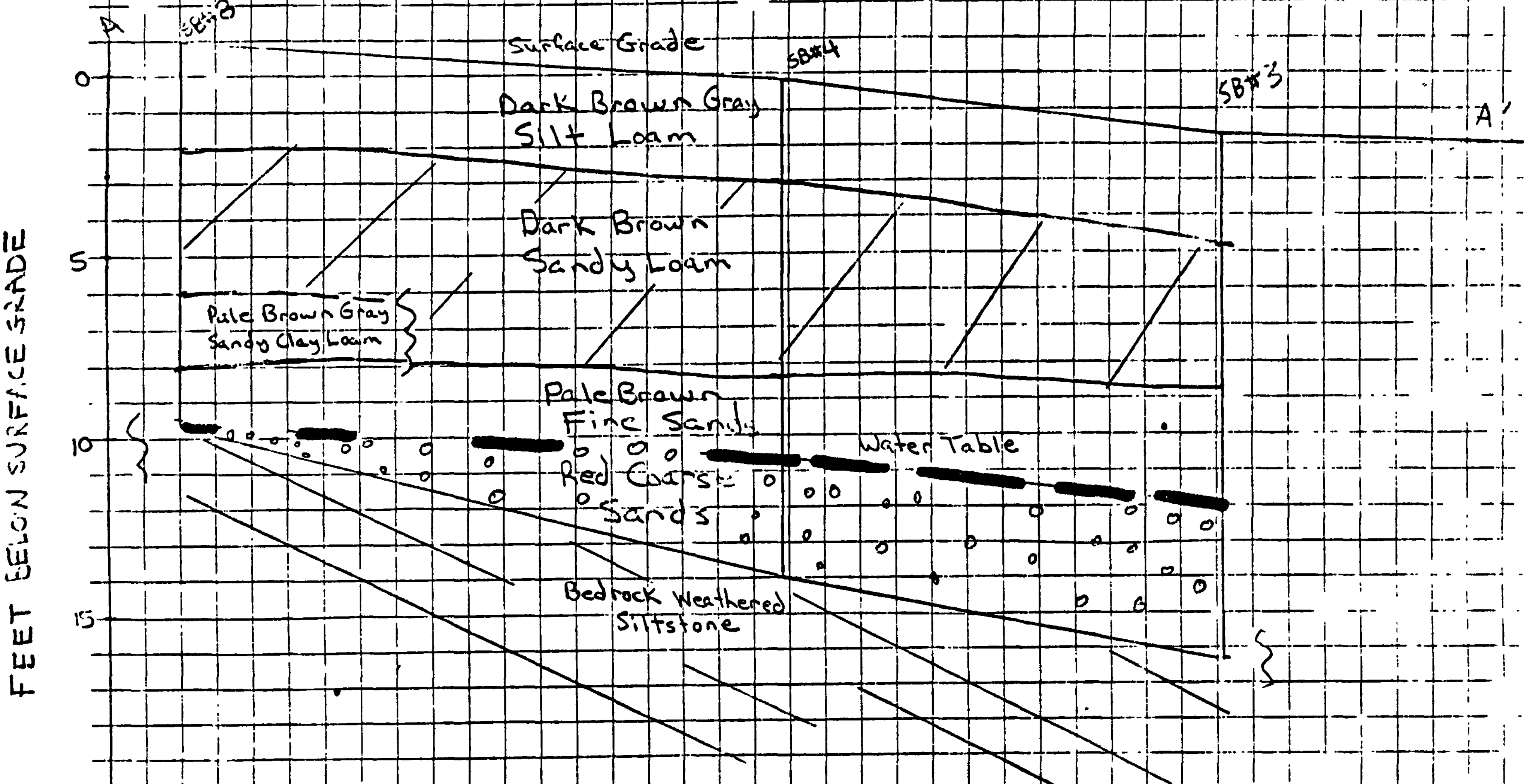
SUMMARY OF HNU SOIL GAS READINGS, PPM OF TOTAL IONIZABLE HYDROCARBON

SOIL SAMPLES	HNU BACKGROUND AIR	HNU READING
895-099	1.0 ppm	300 ppm

NOTE: HNU SOIL GAS READINGS WERE MADE ACCORDING TO THE AMBIENT TEMPERATURE HEADSPACE METHOD.



North-South
Geologic Cross Section
Figure 6



East-West
Geologic Cross Section
Figure 7

TABLES

LOCATION: WILEY POST AIRPORT
5500 N. ROCKWELL
OKLAHOMA CITY, OKLAHOMA

Petroleum Marketers Equipment Co.
2010 Exchange Avenue
Oklahoma City, OK 73108
(405) 235 - 4471

TITLE: SITE ASSESSMENT

SUMMARY OF HNU SOIL GAS READINGS
AMBIENT TEMPERATURE HEADSPACE METHOD ON SOIL SAMPLES

Boring Number	Sample Number	Depth Interval Feet	HNU Reading PPM	Comments
SB-5	1	5	2.0	DARK CLAY LOAM
SB-5	2	10	2.2	ORANGE COARSE SANDS
SB-5	3	15	-----	NO SAMPLE
				THIN LAYER OF OIL ON WATER
				WATER TABLE 120.5 INCHES
				BEDROCK 164 INCHES
				BACKGROUND AIR = 0.80 PPM
SB-6	1	5	3.0	DARK BROWN SANDY LOAM
SB-6	2	10	2.0	RED COARSE SANDS
SB-6	3	15	----	NO SAMPLE
				STRONG GASOLINE SMELL ON WATER
				WATER TABLE 127.25 INCHES
				BEDROCK 180.0 INCHES
				BACKGROUND AIR = 0.80 PPM
SB-7	1	5	2.4	DARK BROWN SANDY LOAM
SB-7	2	10	1.8	PALE BROWN FINE SANDS/RED COARSE
SB-7	3	15	----	NO SAMPLE
				WATER TABLE 115.75 INCHES
				BEDROCK 156.0 INCHES
				BACKGROUND AIR = 0.80 PPM
SB-8	1	5	0.8	DARK BROWN SANDY LOAM
SB-8	2	10	0.8	PALE BROWN AND RED COARSE SANDS
SB-8	3	15	0.8	RED WEATHERED SILTSTONE
				SANDS ARE VERY THIN
				WATER TABLE [illegible] INCHES
				BEDROCK [illegible] INCHES
				BACKGROUND AIR = [illegible]

CLIENT: ATLAS PAVING

Petroleum Marketers Equipment Co.
2010 Exchange Avenue
Oklahoma City, OK 73108
(405) 235 - 4471

LOCATION: WILEY POST AIRPORT
5500 N. ROCKWELL
OKLAHOMA CITY, OKLAHOMA

TITLE: SITE ASSESSMENT

SUMMARY OF HNU SOIL GAS READINGS
AMBIENT TEMPERATURE HEADSPACE METHOD ON SOIL SAMPLES

Boring Number	Sample Number	Depth Interval Feet	HNU Reading PPM	Comments
SB-1	1	5	500.0	DARK CLAY LOAM
SB-1	2	10	1400.0	ORANGE COARSE SANDS
SB-1	3	15	300.0	RED WEATHERED SILTSTONE
				SHEEN ON WATER, GASOLINE ODOR
				WATER TABLE 127.25 INCHES
				BEDROCK 180 INCHES
				BACKGROUND AIR = 0.80 PPM
SB-2	1	5	90.0	DARK BROWN SANDY LOAM
SB-2	2	10	200.0	PALE BROWN FINE SAND
SB-2	3	15	---	NO SAMPLE
				STRONG GASOLINE SMELL ON WATER
				WATER TABLE 127.25 INCHES
				BEDROCK 180.0 INCHES
				BACKGROUND AIR = 0.00 PPM
SB-3	1	5	1.8	BROWN CLAY LOAM
SB-3	2	10	3.0	PALE BROWN FINE SANDS
SB-3	3	15	1.2	RED WEATHERED SILTSTONE
				WATER TABLE 1[illegible].25 INCHES
				BEDROCK 174.0 INCHES
				BACKGROUND AIR = 0.80 PPM
SB-4	1	5	2.6	DARK BROWN SANDY LOAM
SB-4	2	10	2.2	PALE BROWN AND RED COARSE SANDS
SB-4	3	15	1.6	RED WEATHERED SILTSTONE
				WATER TABLE [illegible] INCHES
				BEDROCK 16[illegible] INCHES
				BACKGROUND AIR = 0.8[illegible] PPM

SOIL BORING	SURVEY, INCHES	DIFFERENCE, INCHES
1	47.00	-1.50
2	47.00	-1.50
3	67.00	-21.50
4	47.75	-2.25
5	47.875	-2.375
6	54.875	-9.375
7	46.50	-1.00
8	34.50	+11.00
BENCH MARK	45.50	+0.00

* SURVEY OF SURFACE GRADE

SOIL BORING	WATER TABLE, INCHES
1	127.25
2	127.25
3	122.25
4	124.50
5	120.50
6	104.25
7	115.75
8	129.25

* WATER TABLE FROM SURFACE GRADE

SOIL BORING	BEDROCK, INCHES
1	180.0
2	180.0
3	174.0
4	166.0
5	164.0
6	158.0
7	156.0
8	126.0

* DEPTH TO WEATHERED SILTSTONE FROM SURFACE GRADE

APPENDIX A

AFFIDAVIT OF TANK STATUS

I certify that the following number and sizes of underground gasoline storage tanks were removed from the location as noted. These tanks were purged, and made free from vapors, rendered unusable for future tank storage and hauled to a separate facility. The tanks were disposed of per current Federal, State, and Local requirements.

No.	Size (Gallons)	Locations	Date
1	1000 (Hanger 4)	Wiley Post	11/9/89
1	550 (Hanger 3)	5500 N	
1	300 (Hanger 4)	Okla City, Ok	

Signed Mitch Shart Position Owner

Company: Mac Supply
1900 SW 15th
Okla City, Ok 73108

APPENDIX B

Petroleum Marketers Equipment Co., Inc.
Sales & Service
2010 Exchange Ave. Phone 235-4471
Oklahoma City. Okla. 73108

SAMPLE HISTORY FORM

LAB ID ____________

SAMPLE DESCRIPTION Soil Sandy Loam SAMPLE ID 89S-066

STATE Oklahoma COUNTY Oklahoma

WELL NAME ____________

GEOLOGIC SOURCE Renfrow Dale Port Assoc. SAMPLE INTERVAL* 5ft.

LEGAL LOCATION Wiley Post Airport, Hanger 3, 5500 N. Rockwell, OKC, OK.

DATE 11/10/89 TIME 9:30 A.M.

SAMPLED BY Wes Anderson

LAB NAME & ADDRESS Southwell Laboratory, 1838 SW 13th, OKC, OK.

REMARKS Sample taken at 5ft. Level on Southwall where Highest HNU reading was found.

ANALYSIS (REQUESTED) T.P.H.

*Depth below ground surface

(1)

SOUTHWELL LABORATORY
P.O. BOX 25001
OKLAHOMA CITY, OKLAHOMA 73125
(405) 232-1966

PETROLEUM MARKETERS
2010 EXCHANGE
OKC, OK 73108
ATTN: WES ANDERSON

DATE SAMPLED: 11/10/89
DATE RECEIVED: 11/10/89
DATE REPORTED: 11/10/89

CERTIFICATE OF ANALYSIS

IDENTIFICATION: LAB NUMBER 8910163
SOIL SAMPLES
893-066 WILEY POST AIRPORT, HANGER 3, 5500 N ROCKWEL, OKC
TAKEN AT 5' LEVEL ON SOUTHWALL WHERE HIGHEST HNU WAS FOUND

TOTAL PETROLEUM HYDROCARBON < 10 mg/Kg

DETECTION LIMIT: 10 mg/Kg
METHOD: EPA 418.1
mg/Kg = MILLIGRAMS PER KILOGRAM, EQUIVALENT TO PARTS-PER-MILLION

Petroleum Marketers Equipment Co., Inc.
Sales & Service
2010 Exchange Ave. Phone 235-4471
Oklahoma City, Okla. 73108

SAMPLE HISTORY FORM

LAB ID

SAMPLE DESCRIPTION Soil Sand Loam SAMPLE ID 89S-099

STATE Oklahoma COUNTY Oklahoma

WELL NAME

GEOLOGIC SOURCE Refrew Dale Assoc. SAMPLE INTERVAL* 8 ft.

LEGAL LOCATION Wiley Post Airport, OKC, Hanger 4 AirCraft Sales, ~~for~~ 5500 N. Rockwell/Ok

DATE 11/10/89 TIME 11:30 P.m.

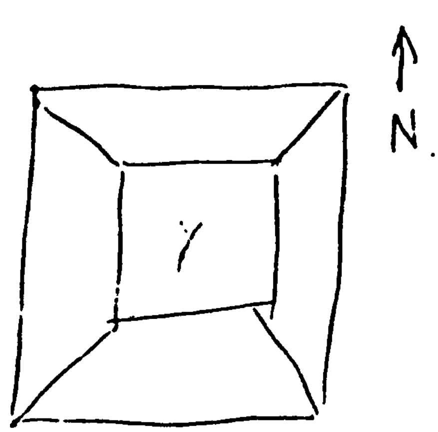
SAMPLED BY Wes Anderson

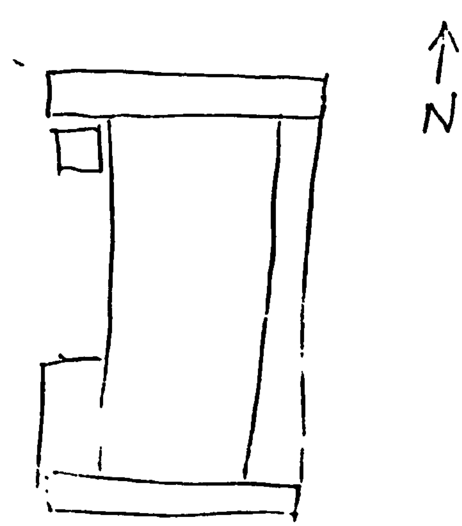
LAB NAME & ADDRESS Southwell Laboratory, 1838 SW 13th, OKC, Ok

REMARKS Sample taken at 8 ft. where highest HNU reading was found.

ANALYSIS (REQUESTED) T.P.H.

*Depth below ground surface





SOUTHWELL LABORATORY
P.O. BOX 25001
OKLAHOMA CITY, OKLAHOMA 73125
(405) 232-1966

PETROLEUM MARKETERS
2010 EXCHANGE
OKC, OK 73108
ATTN: WES ANDERSON

DATE SAMPLED: 11/10/89
DATE RECEIVED: 11/10/89
DATE REPORTED: 11/10/89

CERTIFICATE OF ANALYSIS

IDENTIFICATION: LAB NUMBER 8910164
SOIL SAMPLES
892-099 WILEY POST AIRPORT, OKC AIRCRAFT SALES,
TAKAN AAT 8' WHERE HIGHEST HNU READING WAS FOUND

TOTAL PETROLEUM HYDROCARBON 1,462 mg/Kg

DETECTION LIMIT: 10 mg/Kg
METHOD: EPA 418.1
mg/Kg = MILLIGRAMS PER KILOGRAM, EQUIVALENT TO PARTS-PER-MILLION

Our letters and reports are for the exclusive use of the client to whom they are addressed. The use of our name must receive our prior written approval. Our letters and reports apply only to the sample tested and/or inspected, and are not indicative of the quantities of apparently identical or similar products
Unless notified in writing all samples are disposed of 15 days after the results are first reported.

Petroleum Marketers Equipment Co., Inc.
Sales & Service
2010 Exchange Ave. Phone 235-4471
Oklahoma City, Okla. 73108

SAMPLE HISTORY FORM

LAB ID ____________

SAMPLE DESCRIPTION Soil Sandy Loam SAMPLE ID 89S-100

STATE Oklahoma COUNTY Oklahoma

WELL NAME ____________

GEOLOGIC SOURCE Renfrow Dale Assoc. SAMPLE INTERVAL* '0'6"

LEGAL LOCATION Wiley Post Airport, Southwest Air Central, Hanger 4, 5500 N. Rockwell, OKC, Ok

DATE 11/10/89 TIME 12:00 P.M.

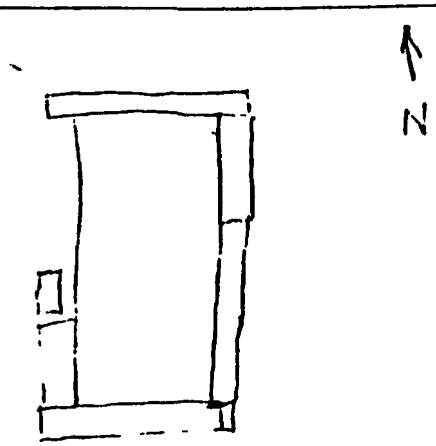
SAMPLED BY Wes Anderson

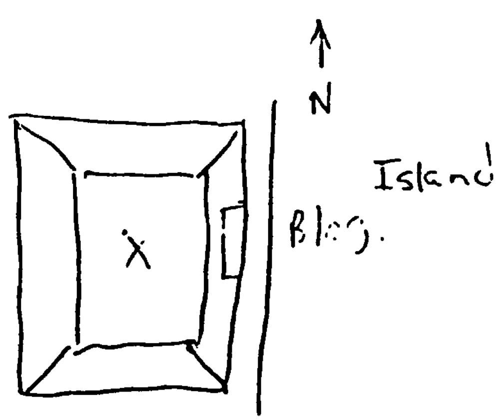
LAB NAME & ADDRESS Southwell Laboratory, 1838 SW 13th, OKC, OK.

REMARKS Sample taken at 10.5 ft. where highest HNU reading was found.

ANALYSIS (REQUESTED) B.T.E.X.

*Depth below ground surface





SOUTHWELL LABORATORY
P.O. BOX 25001
OKLAHOMA CITY, OKLAHOMA 73125
(405) 232-1966

PETROLEUM MARKETERS
2010 EXCHANGE
OKC, OK 73108
ATTN: WES ANDERSON

DATE SAMPLED: 11/10/89
DATE RECEIVED: 11/10/89
DATE REPORTED: 11/10/89

CERTIFICATE OF ANALYSIS

IDENTIFICATION: LAB NUMBER 8910163
SOIL SAMPLES
89S-100 WILEY POST AIRPORT, SW AIR CENTRAL, OKC
TAKEN AT 10.5' WHERE HIGHEST HNU READING WAS FOUND

BTEX

*	DETECTION LIMIT	AMOUNT DETECTED
BENZENE	5.0 ug/Kg	3,400 ug/Kg
TOLUENE	5.0 ug/Kg	22,400 ug/Kg
ETHYL BENZENE	5.0 ug/Kg	10,700 ug/Kg
XYLENES (TOTAL)	5.0 ug/Kg	35,700 ug/Kg

ug/Kg = MICROGRAMS PER KILOGRAM, EQUIVALENT TO PARTS-PER-BILLION.

EPA METHOD: BTEX 8020

Petroleum Marketers Equipment Co., Inc.
Sales & Service
2010 Exchange Ave. Phone 235-4471
Oklahoma City, Okla. 73108

SAMPLE HISTORY FORM

LAB ID ______

SAMPLE DESCRIPTION Water SAMPLE ID 89W-019

STATE Oklahoma COUNTY Oklahoma

WELL NAME ______

GEOLOGIC SOURCE ______ SAMPLE INTERVAL* ______

LEGAL LOCATION Wiley Post Airport, Hanger 4, 5500 N. Rockwell, OKC, OK.

DATE 11/13/89 TIME 9:00 A.M.

SAMPLED BY Wes Anderson

LAB NAME & ADDRESS Southwell Laboratory, 1838 SW 13th, OKC, OK.

REMARKS Sample Blank of water in bailer.

ANALYSIS (REQUESTED) B.T.E.X.

*Depth below ground surface

SOUTHWELL LABORATORY
P.O. BOX 25001
OKLAHOMA CITY, OKLAHOMA 73125
(405) 222-1966

PETROLEUM MARKETERS
2010 EXCHANGE
OKC, OK 73108
ATTN: WES ANDERSON

DATE SAMPLED: 11/13/89
DATE RECEIVED: 11/14/89
DATE REPORTED: 11/15/89

CERTIFICATE OF ANALYSIS

IDENTIFICATION: LAB NUMBER 8910237
WATER SAMPLES
ID#89W-019 WILEY POST AIRPORT, HGR.4, 5500 N. ROCKWELL OKC.
SAMPLE BLANK OF WATER IN BAILER

BTEX

	DETECTION LIMIT	AMOUNT DETECTED
BENZENE	0.2 ug/L	ND
TOLUENE	0.2 ug/L	ND
ETHYL BENZENE	0.2 ug/L	ND
XYLENES (TOTAL)	0.2 ug/L	ND

ug/L = MICROGRAMS PER LITER, EQUIVALENT TO PARTS-PER-BILLION

ND = NONE DETECTED GREATER THAN STATED DETECTION LIMIT

EPA METHOD: BTEX 602

(8)

Petroleum Marketers Equipment Co., Inc.
Sales & Service
2010 Exchange Ave. Phone 235-4471
Oklahoma City, Okla. 73108

SAMPLE HISTORY FORM

LAB ID ____________

SAMPLE DESCRIPTION Water SAMPLE ID 89W-020

STATE Oklahoma COUNTY Oklahoma

WELL NAME SB #1

GEOLOGIC SOURCE Dougherty-Norse-Telker Assoc. SAMPLE INTERVAL* 10.5 ft.

LEGAL LOCATION Wiley Post Airport, Hanger 4, 5500 N. Rockwell, OKC, OK.

DATE 11/13/89 TIME 9:30 A.M.

SAMPLED BY Wes Anderson

LAB NAME & ADDRESS Southwell Laboratory, 1838 SW 13th, OKC, OK.

REMARKS Sample taken from SB#1 at a depth of 10.5 ft.

ANALYSIS (REQUESTED) B.T.E.X.

*Depth below ground surface

SOUTHWELL LABORATORY
P.O. BOX 25001
OKLAHOMA CITY, OKLAHOMA 73125
(405) 232-1966

PETROLEUM MARKETERS
2010 EXCHANGE
OKC, OK 73108
ATTN: WES ANDERSON

DATE SAMPLED: 11/13/89
DATE RECEIVED: 11/14/89
DATE REPORTED: 11/15/89

CERTIFICATE OF ANALYSIS

IDENTIFICATION: LAB NUMBER 8910259
WATER SAMPLES
ID#89W-020 WILEY POST AIRPORT, HGR.4,5500 N. ROCKWELL OKC.
SAMPLE TAKEN FROM SB#1 AT A DEPTH OF 10.5 FT.

BTEX

*	DETECTION LIMIT	AMOUNT DETECTED
BENZENE	0.2 ug/L	41,700 ug/L
TOLUENE	0.2 ug/L	59,700 ug/L
ETHYL BENZENE	0.2 ug/L	14,200 ug/L
XYLENES (TOTAL)	0.2 ug/L	46,700 ug/L

ug/L = MICROGRAMS PER LITER, EQUIVALENT TO PARTS-PER-BILLION.

EPA METHOD: BTEX 602

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10

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Sales & Service
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Oklahoma City, Okla. 73108

SAMPLE HISTORY FORM

LAB ID ____

SAMPLE DESCRIPTION Water SAMPLE ID 89W-021

STATE Oklahoma COUNTY Oklahoma

WELL NAME SB#3

GEOLOGIC SOURCE Dougherty Norge Teller Assoc SAMPLE INTERVAL* 10'5"

LEGAL LOCATION Wiley Post Airport, Hanger 4, 5500 N. Rockwell, OKC, OK.

DATE 11/13/89 TIME 11:30 A.M.

SAMPLED BY Wes Anderson

LAB NAME & ADDRESS Southwell Laboratory, 1838 SW 13th, OKC, OK

REMARKS Sample taken from SB#3 at a depth of 10'5".

ANALYSIS (REQUESTED) B.T.E.X.

*Depth below ground surface

SOUTHWELL LABORATORY
P.O. BOX 25001
OKLAHOMA CITY, OKLAHOMA 73125
(405) 232-1966

PETROLEUM MARKETERS
2010 EXCHANGE
OKC, OK 73108
ATTN: WES ANDERSON

DATE SAMPLED: 11/13/89
DATE RECEIVED: 11/14/89
DATE REPORTED: 11/15/89

CERTIFICATE OF ANALYSIS

IDENTIFICATION: LAB NUMBER 8910259
WATER SAMPLES
ID#89W-021 WILEY POST AIRPORT, HGR. 4, 5500 N. ROCKWELL, OKC
SAMPLE TAKEN FROM SB #3 AT A DEPTH OF 10' 3".

BTEX

	DETECTION LIMIT	AMOUNT DETECTED
BENZENE	0.2 ug/L	1.0 ug/L
TOLUENE	0.2 ug/L	5.0 ug/L
ETHYL BENZENE	0.2 ug/L	3.0 ug/L
XYLENES (TOTAL)	0.2 ug/L	15.0 ug/L

ug/L = MICROGRAMS PER LITER, EQUIVALENT TO PARTS-PER-BILLION.

EPA METHOD: BTEX 602

Petroleum Marketers Equipment Co., Inc.
Sales & Service
2010 Exchange Ave. Phone 235-4471
Oklahoma City, Okla. 73108

SAMPLE HISTORY FORM

LAB ID ______

SAMPLE DESCRIPTION Water SAMPLE ID 89W-022

STATE Oklahoma COUNTY Oklahoma

WELL NAME SB#4

GEOLOGIC SOURCE Dougherty Norse Teller Assoc. SAMPLE INTERVAL* 10'7"

LEGAL LOCATION Wiley Post Airport, Hanger 4, 5500 N. Rockwell, OKC, OK.

DATE 11/13/89 TIME 1:30 p.m.

SAMPLED BY Wes Anderson

LAB NAME & ADDRESS Southwell Laboratory, 1838 SW 13th, OKC, OK.

REMARKS Sample taken from SB#4 at a depth of 10'7".

ANALYSIS (REQUESTED) B.T.E.X.

*Depth below ground surface

SOUTHWELL LABORATORY
P.O. BOX 25001
OKLAHOMA CITY, OKLAHOMA 73125
(405) 232-1966

PETROLEUM MARKETERS
2010 EXCHANGE
OKC, OK 73108
ATTN: WES ANDERSON

DATE SAMPLED: 11/13/89
DATE RECEIVED: 11/14/89
DATE REPORTED: 11/15/89

CERTIFICATE OF ANALYSIS

IDENTIFICATION: LAB NUMBER 8910260
WATER SAMPLES
ID#89W-022 WILEY POST AIRPORT, HGR 4, 5500 N. ROCKWELL OKC
SAMPLE TAKEN FROM SB#4 AT A DEPTH OF 10' 7" TIME 1:30 pm

BTEX *
HYDROCARBON SCAN *

*	DETECTION LIMIT	AMOUNT DETECTED
BENZENE	0.2 ug/L	ND
TOLUENE	0.2 ug/L	ND
ETHYL BENZENE	0.2 ug/L	ND
XYLENES (TOTAL)	0.2 ug/L	ND
HYDROCARBON SCAN	5 ppm	ND

ug/L = MICROGRAMS PER LITER, EQUIVALENT TO PARTS-PER-BILLION
ppm = PARTS-PER-MILLION
ND = NONE DETECTED GREATER THAN STATED DETECTION LIMIT

EPA METHOD: BTEX 602

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(14)

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Sales & Service
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Oklahoma City, Okla. 73108

SAMPLE HISTORY FORM

LAB ID ____________

SAMPLE DESCRIPTION Water   SAMPLE ID 89W-023

STATE Oklahoma   COUNTY Oklahoma

WELL NAME SB#5

GEOLOGIC SOURCE Dougherty Nese Teller Assc.   SAMPLE INTERVAL* ____________

LEGAL LOCATION Wiley Post Airport, Hanger 4, 5500 N. Rockwell; OKC, OK.

DATE 11/13/89   TIME 3:00 P.M.

SAMPLED BY Wes Anderson

LAB NAME & ADDRESS ~~Smith~~

REMARKS Sample taken from SB#5.

ANALYSIS (REQUESTED) Visual 1/32" Free Floating Oil.

*Depth below ground surface

Petroleum Marketers Equipment Co., Inc.
Sales & Service
2010 Exchange Ave. Phone 235-4471
Oklahoma City, Okla. 73108

SAMPLE HISTORY FORM

LAB ID ______

SAMPLE DESCRIPTION Water SAMPLE ID 89W-024

STATE Oklahoma COUNTY Oklahoma

WELL NAME SB#6

GEOLOGIC SOURCE Dougherty-Norse-Teller Assoc. SAMPLE INTERVAL* ______

LEGAL LOCATION Wiley Post Airport, Hanger 4, 5500 N. Rockwell, OKC, Ok.

DATE 11/13/89 TIME 4:00 P.M.

SAMPLED BY Wes Anderson

LAB NAME & ADDRESS Southwell Laboratory, 1938 SW 13th, OKC, Ok

REMARKS Sample taken from SB#6.

ANALYSIS (REQUESTED) Total Hydrocarbon Scan

*Depth below ground surface

SOUTHWELL LABORATORY
P.O. BOX 25001
OKLAHOMA CITY, OKLAHOMA 73125
(405) 232-1966

PETROLEUM MARKETERS
2010 EXCHANGE
OKC, OK 73108
ATTN: WES ANDERSON

DATE SAMPLED: 11/13/89
DATE RECEIVED: 11/14/89
DATE REPORTED: 11/15/89

CERTIFICATE OF ANALYSIS

IDENTIFICATION: LAB NUMBER 8910261
WATER SAMPLES
ID#89W-024 WILEY POST AIRPORT HGR.4, 5500 N. ROCKWELL OKC
SAMPLE TAKEN FROM SB#6 TIME 4:00 pm

HYDROCARBON SCAN	NONE DETECTED

DETECTION LIMIT: 5 ppm

EPA METHOD	8000

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Sales & Service
2010 Exchange Ave. Phone 235-4471
Oklahoma City. Okla. 73108

SAMPLE HISTORY FORM

LAB ID ____________

SAMPLE DESCRIPTION Water SAMPLE ID 89W-025

STATE Oklahoma COUNTY Oklahoma

WELL NAME SB # 7

GEOLOGIC SOURCE Dougherty-Norge-Teller Assoc. SAMPLE INTERVAL* ____________

LEGAL LOCATION Wiley Post Airport, Hanger 4, 5500 N. Rockwell, OKC, OK.

DATE 1/14/89 TIME 8:30 A.m.

SAMPLED BY Wes Anderson

LAB NAME & ADDRESS Southwell Laboratory, 1838 SW 13th, OKC, Ok.

REMARKS Sample taken from SB#7

ANALYSIS (REQUESTED) Total Hydrocarbon Scan

*Depth below ground surface

SOUTHWELL LABORATORY
P.O. BOX 25001
OKLAHOMA CITY, OKLAHOMA 73125
(405) 232-1966

PETROLEUM MARKETERS
2010 EXCHANGE
OKC, OK 73108
ATTN: WES ANDERSON

DATE SAMPLED: 11/14/89
DATE RECEIVED: 11/14/89
DATE REPORTED: 11/15/89

CERTIFICATE OF ANALYSIS

IDENTIFICATION: LAB NUMBER 8910262
WATER SAMPLES
ID#89W-025 WILEY POST AIRPORT HGR. 4, 5500 N. ROCKWELL OKC
SAMPLE TAKEN FROM SB #7 TIME 8:30 am

HYDROCARBON SCAN	NONE DETECTED

DETECTION LIMIT: 5 ppm

EPA METHOD	8000

Petroleum Marketers Equipment Co., Inc.
Sales & Service
2010 Exchange Ave. Phone 235-4471
Oklahoma City, Okla. 73108

SAMPLE HISTORY FORM

LAB ID ______

SAMPLE DESCRIPTION Water SAMPLE ID 89W-026

STATE Oklahoma COUNTY Oklahoma

WELL NAME SB#8

GEOLOGIC SOURCE Dougherty-Nenge-Teller Assoc. SAMPLE INTERVAL* ______

LEGAL LOCATION Wiley Post Airport, Hanger 4, 5500 N. Rockwell, OKC, OK

DATE 11/14/89 TIME 8:00 A.M.

SAMPLED BY Wes Anderson

LAB NAME & ADDRESS Southwell Laboratory, 1838 SW 13th, OKC, OK.

REMARKS Sample taken from SB#8

ANALYSIS (REQUESTED) Total Hydrocarbon Scan

*Depth below ground surface

SOUTHWELL LABORATORY
P.O. BOX 25001
OKLAHOMA CITY, OKLAHOMA 73125
(405) 232-1966

PETROLEUM MARKETERS
2010 EXCHANGE
OKC, OK 73108
ATTN: WES ANDERSON

DATE SAMPLED: 11/14/89
DATE RECEIVED: 11/14/89
DATE REPORTED: 11/15/89

CERTIFICATE OF ANALYSIS

IDENTIFICATION: LAB NUMBER 8910263
WATER SAMPLES
ID#89W-026 WILEY POST AIRPORT MSP 4, 5500 N. ROCKWELL OKC
SAMPLE TAKEN FROM SB #8 TIME 8:00 am

HYDROCARBON SCAN	NONE DETECTED

DETECTION LIMIT: 5 ppm

EPA METHOD	8000

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OKD987070059

S1 References

PART 3

REFERENCE 5

DOCUMENTATION REPORT

ON AN

UNDERGROUND STORAGE TANK

REMOVAL

WILEY POST AIRPORT

5500 N. ROCKWELL

OKLAHOMA CITY

Prepared by

Petroleum Marketers Equipment Co.

2010 Exchange Ave.

Oklahoma City, Oklahoma 73108

May 7, 1990

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3.0 SITE INVESTIGATION

4.0 RESULTS OF INVESTIGATION

5.0 CONCLUSION

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APPENDIX B

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5. Soil Gas Sampling Sites Sampled Immediately Following Hanger 3C, UST Removal.

DOCUMENTATION REPORT ON AN
UNDERGROUND STORAGE TANK REMOVAL
WILEY POST AIRPORT, HANGER 2,3A and 3C
OKLAHOMA CITY, OKLAHOMA

1.0 INTRODUCTION

Males Brothers contracted Petroleum Marketers Equipment Co. (PMECO) to remove three underground storage tank's (UST's) at Wiley Post Airport in Oklahoma City (5500 NW Rockwell). Oklahoma City Airport Authority chose to remove the tanks because they where no longer needed. On February 16, 1990 a 550 gallon waste/oil tank was removed at Hanger 2, 550 gallon waste/oil were removed from Hanger 3C. On February 17, 1990 a 1,000 gallon unlead was removed from Hanger 3A.

The unleaded UST tank had previously been used for fueling of company vehicles and waste/oil tanks were utilized by the leasing companies for disposal of used oil. On February 16 and 17, 1990 Wes Anderson, Petroleum Marketers Equipment Company's Environmental Specialist conducted a site assessment of the excavation areas.

2.0 DOCUMENTATION OF UST REMOVAL

2.1 Tank Condition:

Upon removal all UST's were visually inspected by PMECO personnel for signs of corrosion or holes in the tank. The UST's were bare steel. The 550 gallon waste/oil tanks at Hanger 2, and 3c were in fair condition and showed some signs of pitting, but, no holes were discovered. The 1000 gallon unleaded tank removed from Hanger 3A was in good condition. There were no holes discovered due to corrosion.

2.2 Dispenser/Vent Line Condition:

Visual examination of the vent line and dispenser line (including the couplings to the tank) showed these lines to be in fair condition with some corrosion starting. The dispenser lines and the vent lines were both made of steel.

2.3 Product Removal From The UST:

On February 16, 1990, arrangements were made with Oklahoma Tank Service for removal of the fuel and waste oil for appropriate disposal. Approximately 15 Barrels of waste oil and unleaded gasoline was removed from the UST's (Appendix A).

2.4 Removal of Gasoline Vapors From Tank:

PMECO removed the vapors from the UST's by placing approximately 1.5 pounds per 100 gallons of dry ice (frozen carbon dioxide) in the tanks. The frozen carbon dioxide evolved CO2 gas as it melted, displacing the gasoline vapors in the tank. All gasoline vapors were displaced to a level well below the lower explosive limit (LEL) as measured on an explosimeter prior to tank removal and transportation for disposal.

2.5 UST Excavation:

Prior to the excavation of the UST, all power sources leading to the tank were identified and disconnected. The UST was excavated and removed using a backhoe. Groundwater was not encountered during the UST excavation.

2.6 UST Disposal:

PMECO (at Males Brother's direction) arranged for the disposal of the UST and associated dispenser and vent piping at Mac Supply. Factual documentation of this disposal are found in Appendix A.

3.0 SITE INVESTIGATION

3.1 Organic Vapor Survey:

PMECO's Environmental Specialist collected several soil samples from the bottom and sidewalls of the UST's excavations. PMECO conducted ambient temperature headspace (ATH) analyses on the soil samples collected from the excavation sidewalls and bottom. The ATH method consists of collecting discreet soil samples and placing the soil in a glass container, leaving a vacant headspace in the glass container and sealing the container with a double layer of Aluminum Foil.

The headspace gas in each glass sample container is then analyzed for organic vapors using a portable HNU photoionization detector. The resulting HNU headspace gas reads in parts per million (ppm) to total ionizable hydrocarbon based on a benzene standard. The HNU photoionization detector was calibrated to a known benzene gas prior to the headspace readings. The HNU detector has a limit of detection of 200 parts per billion of total ionizable hydrocarbon. Results of ambient temperature headspace gas readings are recorded on Figure 4 and 5.

3.2 Product Inventory Records

No inventory records are available for this report.

3.3 Groundwater Observations

No groundwater was observed during the course of work that took place.

4.0 RESULTS OF INVESTIGATION

4.1 Site Stratigraphy

The site rest on Terrace deposits a few feet thick which are underlain by rocks of Pennsylvanian and Permian age which dip toward the southwest at about forty (40) feet per mile. Erosion has formed a gently rolling surface in the area. The topography at the sight slopes slightly West and is approximated at about 1350 feet above mean sea level. The nearest surface water is the Lake Hefner Canal estimated to be 1500 feet West of the site.

The location area is underlain by Terrace Deposits of red coarse grain sands about 2 to 5 feet thick followed by the Bison and Salt Plains Formation of the Permian-age Hennessey Group. The Salt Plains Formation is reported in the literature as a red-brown blocky shale and an orange-brown siltstone (Bingham and Moore, 1975). It has a reported thickness of approximately two-hundred (200) feet in the Oklahoma City area. This Formation is underlain by the Kingman Siltstone (thickness approximately thirty (30) feet, which in turn is underlain by the Fairmont shale, thickness approximately thirty (30) feet. The Garber Sandstone underlies the Fairmont Shale, with the top of the sandstone occurring at a depth of approximately 260 feet beneath the site.

The native lithologic units encountered in the upper ten (10) feet at the site are of the Dougherty-Norge-Teller association according to The Oklahoma County Soil Survey (Figure 2). The upmost layer of soil ranging from .5 to 3 feet is a dark gray silt loam. The following layer ranges from 3 to 7 feet which consist of dark brown sandy loam. Fine sands to red coarse sands range to the 13 foot level. Underlying this is a weathered orange brown siltstone below the location. This unit has a reported thickness of approximately two-hundred (200) feet (Bingham and Moore, 1975).

The Wiley Post location is underlain by approximately 2 to 5 feet of terrace deposits. These deposits overlay the bedrock of the Hennessey Group and have available yields of water in most areas.

The Hennessey Group is not a major water-producing aquifer in this area due to its lithological characteristics. It is composed primarily of low-permeable shales and siltstones. Small quantities of groundwater are typically obtained from this group from the weathered material above the unaltered shales and siltstones. Wells drilled into this group typically yield small quantities of fair to poor quality water.

4.2 Soil Analytical Test Results

A representative sample of the soil in the tank excavations was taken where the highest HNU readings were found for each tank hole. According to the soil gas survey conducted on the excavations, these samples represented where contamination would most likely occur.

The samples were taken to Southwell Laboratory for laboratory analysis. Total Petroleum Hydrocarbon analysis was performed for waste oil tanks and B.T.E.X analysis was performed for the unlead gasoline tank excavation. Results showed both Hanger 2 and 3c to be below detectable levels (<1.0PPM) for hydrocarbon analysis. Lab analysis for Hanger 3A showed B.T.E.X. concentrations of 161.2 ppm. All analytical test results are submitted in Appendix B.

5.0 Conclusion

Based upon the HNU head space soil vapor survey, lab analysis, visual soil, and groundwater observations, it is evident that there is a gasoline impact at the Hanger 3A tank excavation above current corrective action levels for the State of Oklahoma. Further investigation will be required to determine the possible extent of the contamination.

Tank excavations located at Hanger 2 and 3C were backfilled to grade and covered. No further investigation will be required.

Hanger 3A, was backfilled temporarily due to personnel traffic and structure of building integrity per Wiley Post Authority's.

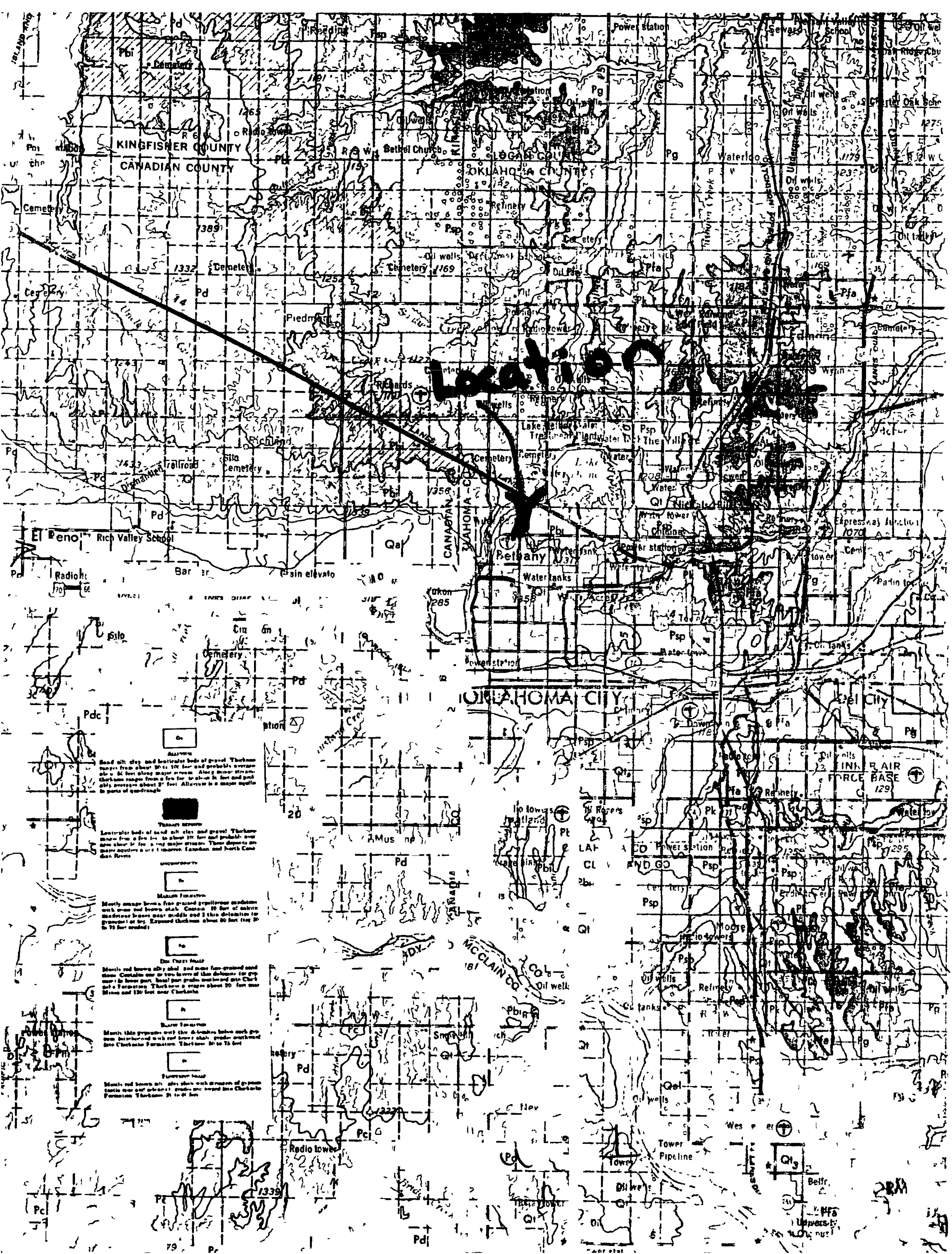
REFERENCES

1. Bingham and Moore, 1975,
   Reconnaissance of the Water Resources of the Oklahoma City Quadrangle, Central Oklahoma; Hydrologic Atlas #4, Oklahoma Geological Survey

2. Van Zyl et al, 1987, Geotechnical and Geohydrological Aspects of Waste Management, Lewis Publishers, Inc. page 287-299.

3. United States Department of Agriculture, 1969, Soil Survey, Oklahoma County, Oklahoma; Soil Conservation Service In cooperation with Oklahoma Agricultural Experiment Station.

FIGURES


Location
KINGFISHER COUNTY
CANADIAN COUNTY
LOGAN COUNTY
OKLAHOMA COUNTY
OKLAHOMA CITY
El Reno
Rich Valley School
Piedmont
Richland
Bethany
Yukon
Bethel Church
Waterloo
Seward
Charter Oak Sch
Del City
TINKER AIR FORCE BASE
Moore
Expressway Junction
Power station
Refinery
Oil wells
Cemetery
Radio tower
Water tanks
Dismantled railroad
Grain elevator
McCLAIN CO
CLEVELAND CO
Pipeline

2

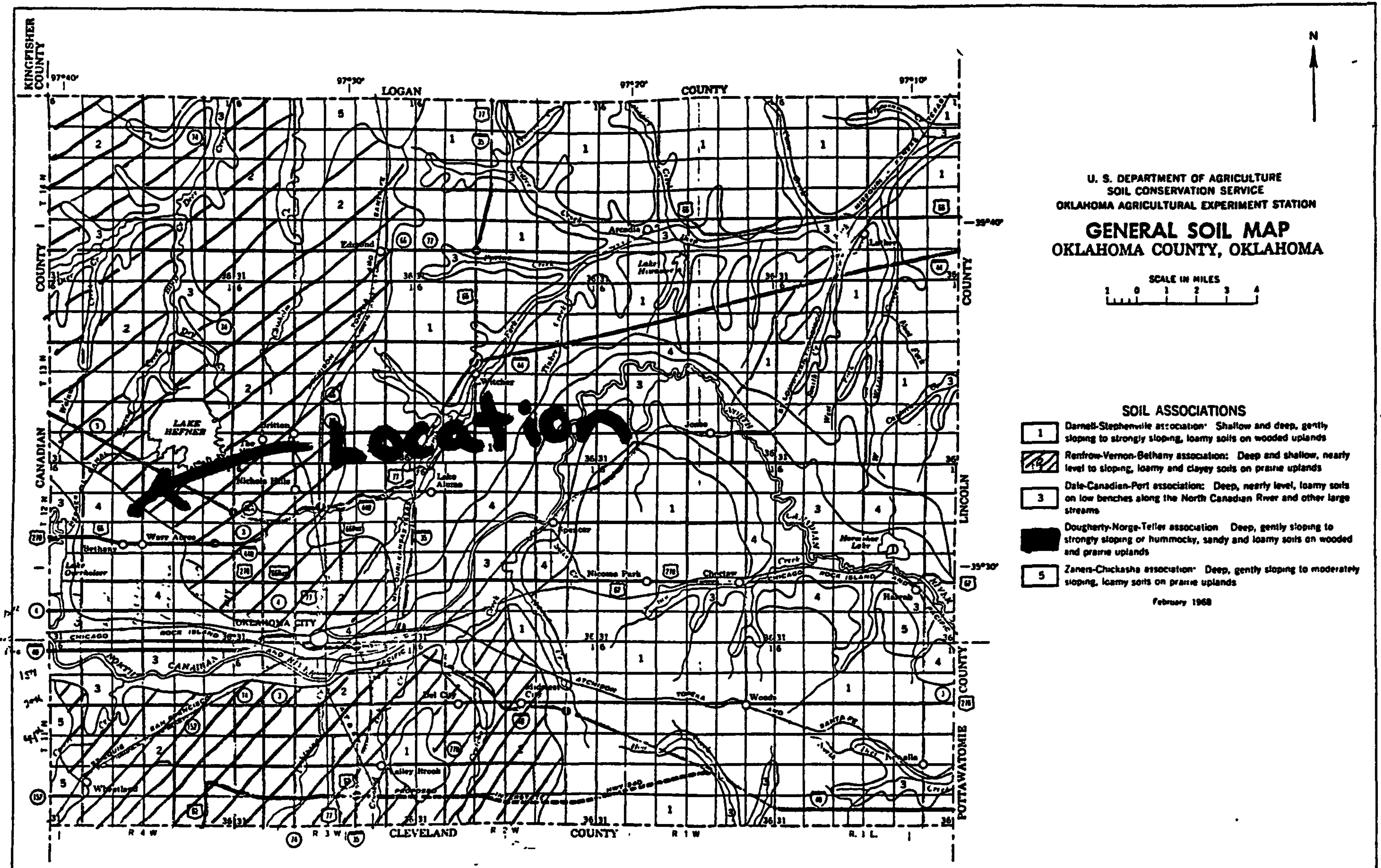
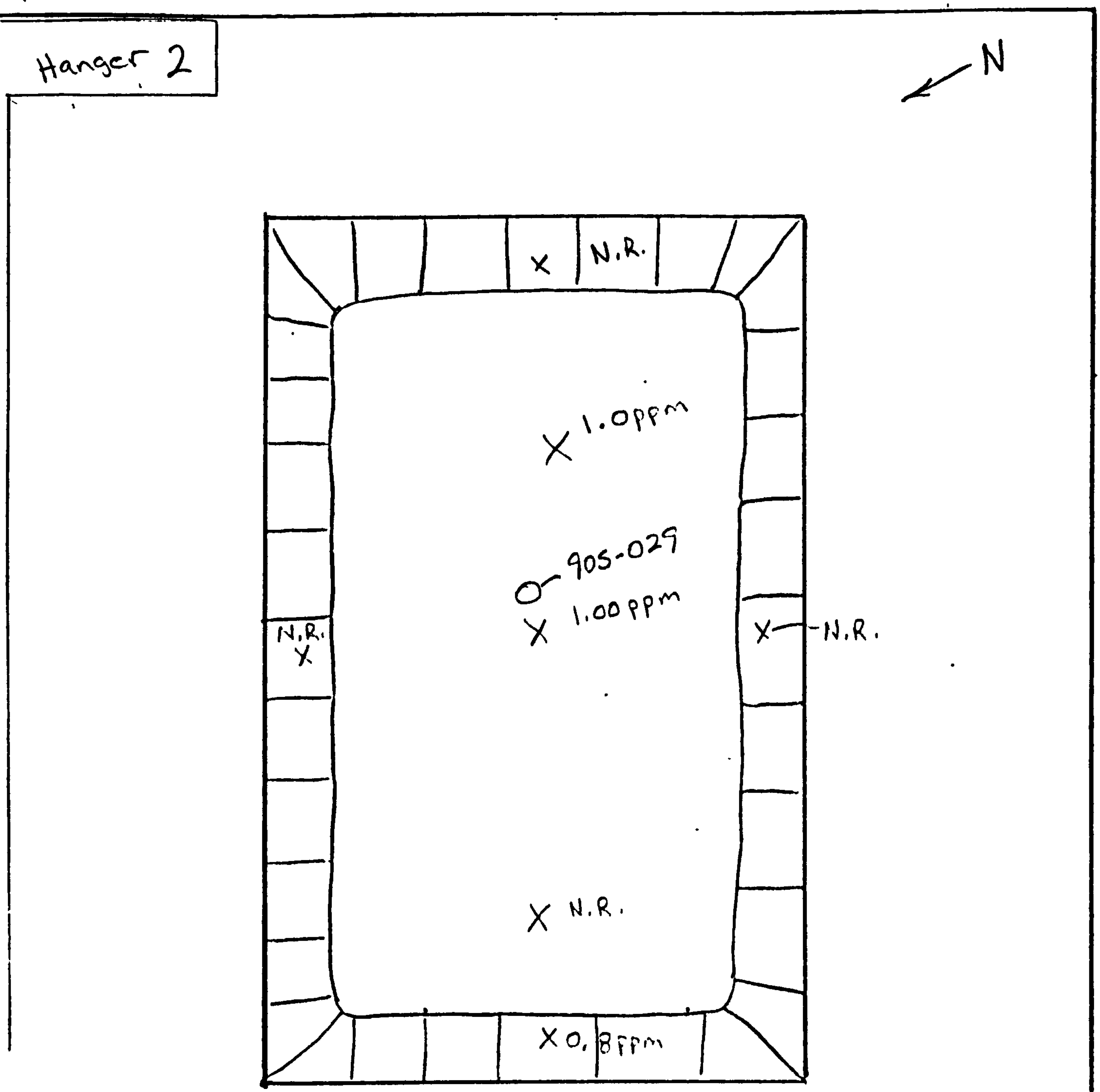

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
OKLAHOMA AGRICULTURAL EXPERIMENT STATION
GENERAL SOIL MAP
OKLAHOMA COUNTY, OKLAHOMA
SCALE IN MILES
1 0 1 2 3 4
SOIL ASSOCIATIONS
1 Darnell-Stephenville association: Shallow and deep, gently sloping to strongly sloping, loamy soils on wooded uplands
2 Renfrow-Vernon-Bethany association: Deep and shallow, nearly level to sloping, loamy and clayey soils on prairie uplands
3 Dale-Canadian-Port association: Deep, nearly level, loamy soils on low benches along the North Canadian River and other large streams
Dougherty-Norge-Teller association: Deep, gently sloping to strongly sloping or hummocky, sandy and loamy soils on wooded and prairie uplands
5 Zaneis-Chickasha association: Deep, gently sloping to moderately sloping, loamy soils on prairie uplands
February 1968
N
KINGFISHER COUNTY
LOGAN COUNTY
LINCOLN COUNTY
POTTAWATOMIE COUNTY
CLEVELAND COUNTY
CANADIAN COUNTY
LAKE HEFNER
OKLAHOMA CITY
Edmond
Arcadia
Luther
Jones
Spencer
Choctaw
Harrah
Nicoma Park
Midwest City
Del City
Bethany
Warr Acres
Nichols Hills
Britton
Lake Aluma
Witcher
Valley Brook
Woods
Wheatland
Lake Overholser
Lake Hiwassee
Newalla
97°40'
97°30'
97°20'
97°10'
35°40'
35°30'
R 4 W
R 3 W
R 2 W
R 1 W
R 1 E
Location

Figure 2

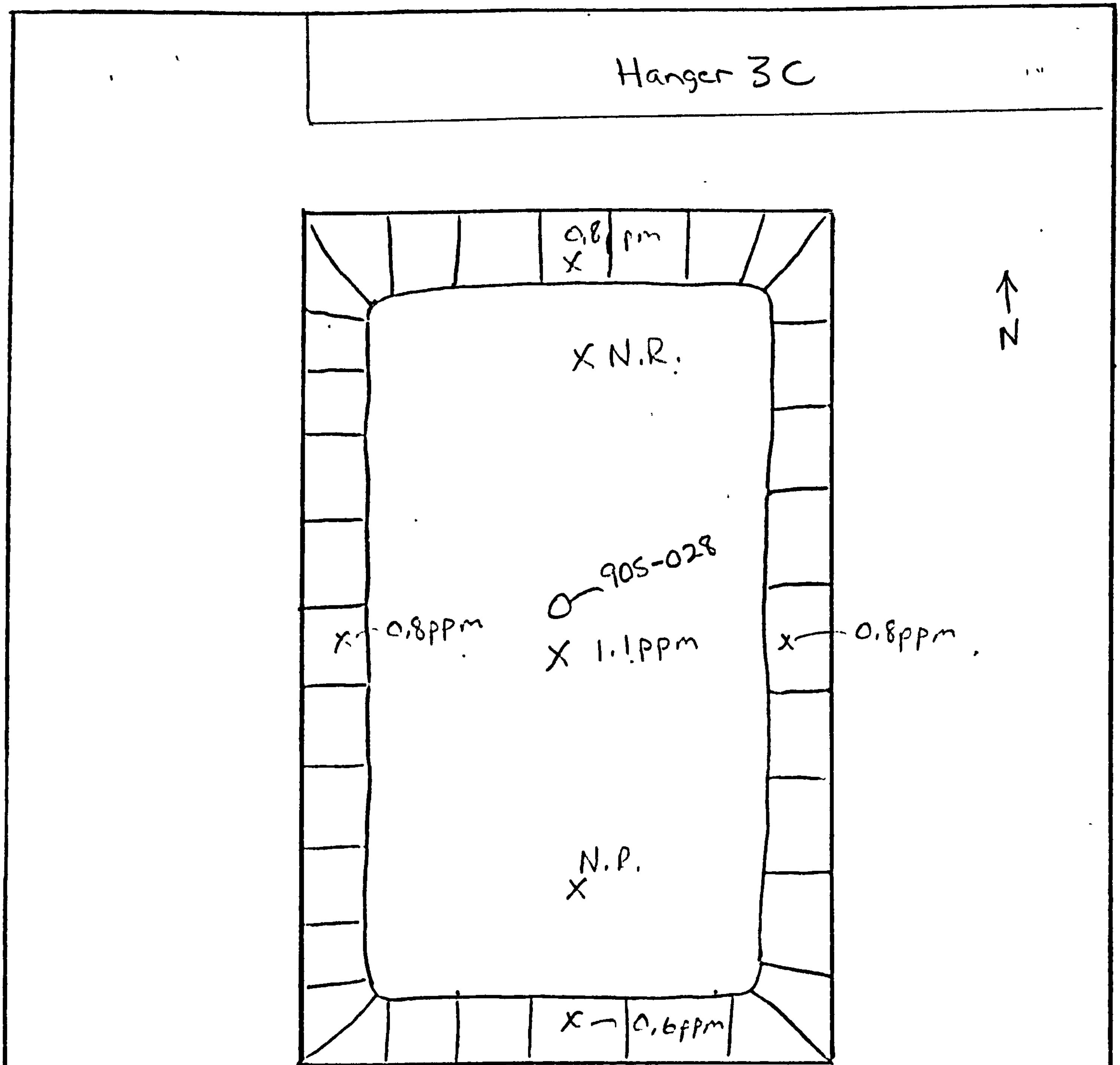


X = Sampling Points, Soil Gas Survey
O = Location of sampling for Laboratory analysis.
N.R. = No Response

SCALE

Figure 3

FIGURE TITLE: Hanger 2, Removal 550 gallon Waste/oil Tank	CLIENT: Males Brothers/Wiley Post
	LOCATION: Wiley Post Airport, 5500 N. Rockwell
COMMENTS: Soil Gas Survey of tank excavation area using HNU. Sample taken at highest reading for Laboratory analysis.	PETROLEUM MARKETERS EQUIPMENT CO. 2010 Exchange Ave. OKLAHOMA CITY, OK 73108
DRAWN BY: Wes Anderson	

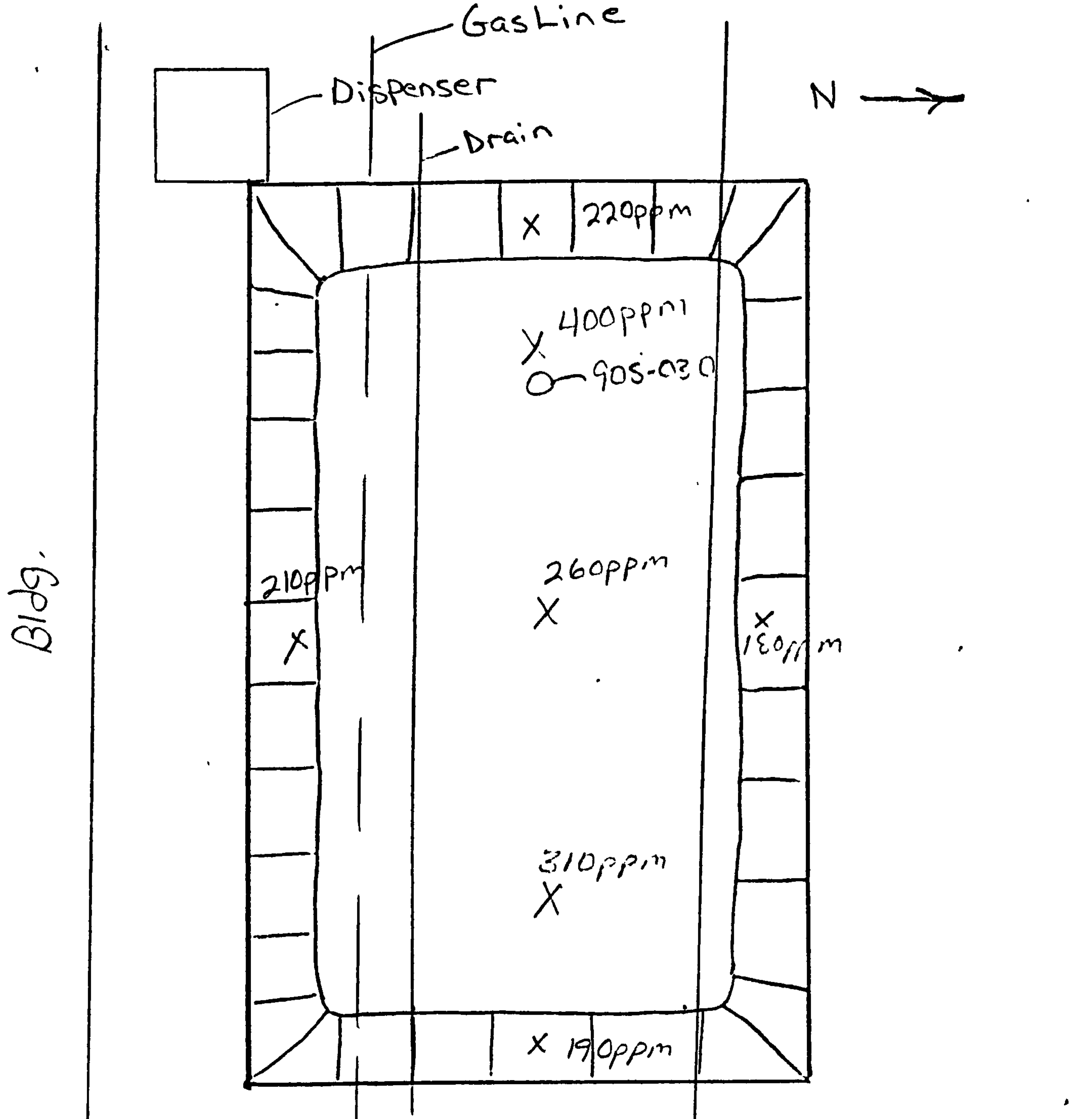


X = Sampling Points, Soil Gas Survey
O = Sampling Point, Lab Analysis
N.R. = No Response

SCALE

Figure 4

FIGURE TITLE: Hanger 3C, Removal 530 gallon Waste/oil Tank	**CLIENT:** Males Brothers/Wiley Post
	LOCATION: Wiley Post Airport, [illegible]
COMMENTS: Soil Gas Survey of tank excavation area using HNU. Sample taken at highest reading for laboratory analysis.	PETROLEUM MARKETERS EQUIPMENT CO. 2010 Exchange Ave. OKLAHOMA CITY, OK 73108
DRAWN BY: [illegible]	



X: Sampling Points, Soil Gas Survey
O= Sampling Point, Lab Analysis

SCALE

Figure 5

FIGURE TITLE: Hanger 3A, Removal 1,000 gallon Unlead gasoline Tank	CLIENT: Males Brothers/Wiley Post
	LOCATION: Wiley Post Airport, 5500 N. Rockwell
COMMENTS: Soil Gas Survey of tank excavation area using HNU. Sample taken at highest reading for Laboratory Analysis.	PETROLEUM MARKETERS EQUIPMENT CO. 2010 Exchange Ave. OKLAHOMA CITY, OK 73108
DRAWN BY: Wes Anderson	

APPENDIX A

AFFIDAVIT OF TANK STATUS

I certify that the following number and sizes of underground gasoline storage tanks were removed from the location as noted. These tanks were purged and made free from vapors, rendered unusable for future tank storage and hauled to a seperate facility. The tanks were disposed of per current Federal, State and Local requirements.

Number	Size (Gallons)	Location	Date
2	550	WILEY POST AIRPORT	2/16/90
1	1,000	5500 N. ROCKWELL	
		OKC, OK.	

Signed: [signature] Position owner

COMPANY: MAC SUPPLY
1900 SW 15TH
OKC, OK. 73108

FIELD TICKET

OKLAHOMA TANK SERVICE, INC.
P.O. BOX 94281 OKLAHOMA CITY, OKLA. 73143

95546

MOORE, OK 405/799-3331

COGAR, OK 405/352-4352

16175-5

Charge To: Petroleum Marketers

Date 2-16-90

Lease Wiley Post

W. O. No.

Ordered By

Released By

SERVICE	AMOUNT	UNIT COST	TOTAL
☐ Dump Truck			
☐ Backhoe			
☒ Bobtail Vacuum Truck	2 hrs	41.25	82.50
☐ Transport Vacuum Gear Truck			
☐ Hot Oil Unit			
☐ 500 Bbl. Frac Tanks			
☐ Extra Days			
☐ Diesel Fuel ☐ Crude Oil ☐ LPG			
☐ Drilling Mud			
☒ Disposal	15 bbl	.20	3.00
☐ Fresh Water			
☐ KCL Water			

Remarks: Pick 15 bbl sludge oil to [illegible], Empty underground Tanks

Tax

Customer

Total 85.50

Driver [illegible] Trk. # 1 3

COMMERCIAL PRESS

APPENDIX B

Petroleum Marketers Equipment Co., Inc.
Sales & Service
2010 Exchange Ave. Phone 235-4471
Oklahoma City, Okla. 73108

SAMPLE HISTORY FORM

LAB ID ______

SAMPLE DESCRIPTION Soil SAMPLE ID 90S-028

STATE Oklahoma COUNTY Oklahoma

WELL NAME ______

GEOLOGIC SOURCE Doughtery-Norge-Felker Assoc. SAMPLE INTERVAL* 7 ft.

LEGAL LOCATION Wiley Post Airport, Hanger 3C, 5500 NW Rockwell, OK

DATE 2/16/90 TIME 4:45 P.M.

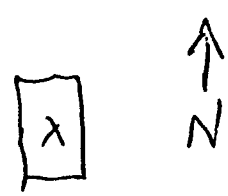
SAMPLED BY Wes Anderson

LAB NAME & ADDRESS Southwell Laboratory, 1838 SW 13th, OKC, OK.

REMARKS Hanger 3C, sampled at 7 ft., at bottom of tank excavation

ANALYSIS (REQUESTED) T.P.H.

*Depth below ground surface



SOUTHWELL LABORATORY
P.O. BOX 25001
OKLAHOMA CITY, OKLAHOMA 73125
(405) 232-1966

PETROLEUM MARKETERS
2010 EXCHANGE
OKC, OK 73103
ATTN: WES ANDERSON

DATE SAMPLED: 2/16/90
DATE RECEIVED: 2/19/90
DATE REPORTED: 2/19/90

C E R T I F I C A T E   O F   A N A L Y S I S

IDENTIFICATION: LAB NUMBER 9001843
SOIL SAMPLES
90S-028 -WILEY POST AIRIPORT, HANGER 3C, 5500 N. ROCKWELL
BETHANY, OK -SAMPLED AT 7' AT BOTTOM OF TANK EXCAVATION

TOTAL PETROLEUM HYDROCARBON < 1 mg/Kg

.
.
.
DETECTION LIMIT: 1 mg/Kg
.
mg/Kg = MILLIGRAM PER KILOGRAM, EQUIVALENT TO PARTS-PER-MILLION
.
EPA METHOD: 8000 (GC/FID)
.
.

Petroleum Marketers Equipment Co., Inc.
Sales & Service
2010 Exchange Ave. Phone 235-4471
Oklahoma City, Okla. 73108

SAMPLE HISTORY FORM

LAB ID ______

SAMPLE DESCRIPTION Soil SAMPLE ID 905-029

STATE Oklahoma COUNTY Oklahoma

WELL NAME ______

GEOLOGIC SOURCE Doughtery-Norge-Teller Assoc. SAMPLE INTERVAL* 7 ft.

LEGAL LOCATION Wiley Post Airport, Hanger 2, 5500 N.W. Rockwell, OKC, OK

DATE 2/16/90 TIME 5:00 P.M.

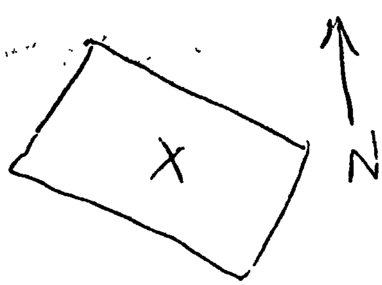
SAMPLED BY Wes Anderson

LAB NAME & ADDRESS Southwell Laboratory, 1838 SW 13th, OKC, OK.

REMARKS Hanger 2, sampled at 7ft. at bottom of excavation

ANALYSIS (REQUESTED) T.P.H.

*Depth below ground surface



SOUTHWELL LABORATORY
P.O. BOX 75001
OKLAHOMA CITY, OKLAHOMA 73125
(405) 232-1966

PETROLEUM MARKETERS
2010 EXCHANGE
OKC, OK 73108
ATTN: WES ANDERSON

DATE SAMPLED: 2/16/90
DATE RECEIVED: 2/19/90
DATE REPORTED: 2/19/90

C E R T I F I C A T E   O F   A N A L Y S I S

IDENTIFICATION: LAB NUMBER 9001844
SOIL SAMPLES
90S-029 - WILEY POST AIRPORT, HANGER 2, 5500 N. ROCKWELL,
BETHANY, OK - SAMPLED AT 7' AT BOTTOM OF EXCAVATION

TOTAL PETROLEUM HYDROCARBON < 1 mg/Kg

DETECTION LIMIT: 1 mg/Kg

mg/Kg = MILLIGRAM PER KILOGRAM, EQUIVALENT TO PARTS-PER-MILLION

EPA METHOD: 8000 (GC/FID)

Petroleum Marketers Equipment Co., Inc.
Sales & Service
2010 Exchange Ave. Phone 235-4471
Oklahoma City, Okla. 73108

SAMPLE HISTORY FORM

LAB ID ____________

SAMPLE DESCRIPTION Soil SAMPLE ID 905-030

STATE Oklahoma COUNTY Oklahoma

WELL NAME ____________

GEOLOGIC SOURCE Doughtery-Norse-Telke Assoc. SAMPLE INTERVAL* ____________

LEGAL LOCATION Wiley Post Airport, Hanger 3A, 5500 NW Rockwell

DATE 2/17/90 TIME 10:30 A.M.

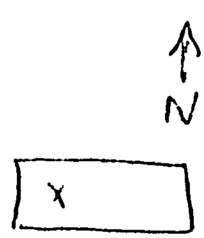
SAMPLED BY Wes Anderson

LAB NAME & ADDRESS Southwell Laboratory, 1838 SW 13th, OKC, OK.

REMARKS Hanger 3A, West end of unlead tank excavation on bottom.

ANALYSIS (REQUESTED) B, T, E, X,

*Depth below ground surface



SOUTHWELL LABORATORY
P.O. BOX 2[illegible]01
OKLAHOMA CITY, OKLAHOMA 7312[illegible]
(405) 232-1966

PETROLEUM MARKETERS
2010 EXCHANGE
OKC, OK 73108
ATTN: WES ANDERSON

DATE SAMPLED: 2/17/90
DATE RECEIVED: 2/19/90
DATE REPORTED: 2/19/90

CERTIFICATE OF ANALYSIS

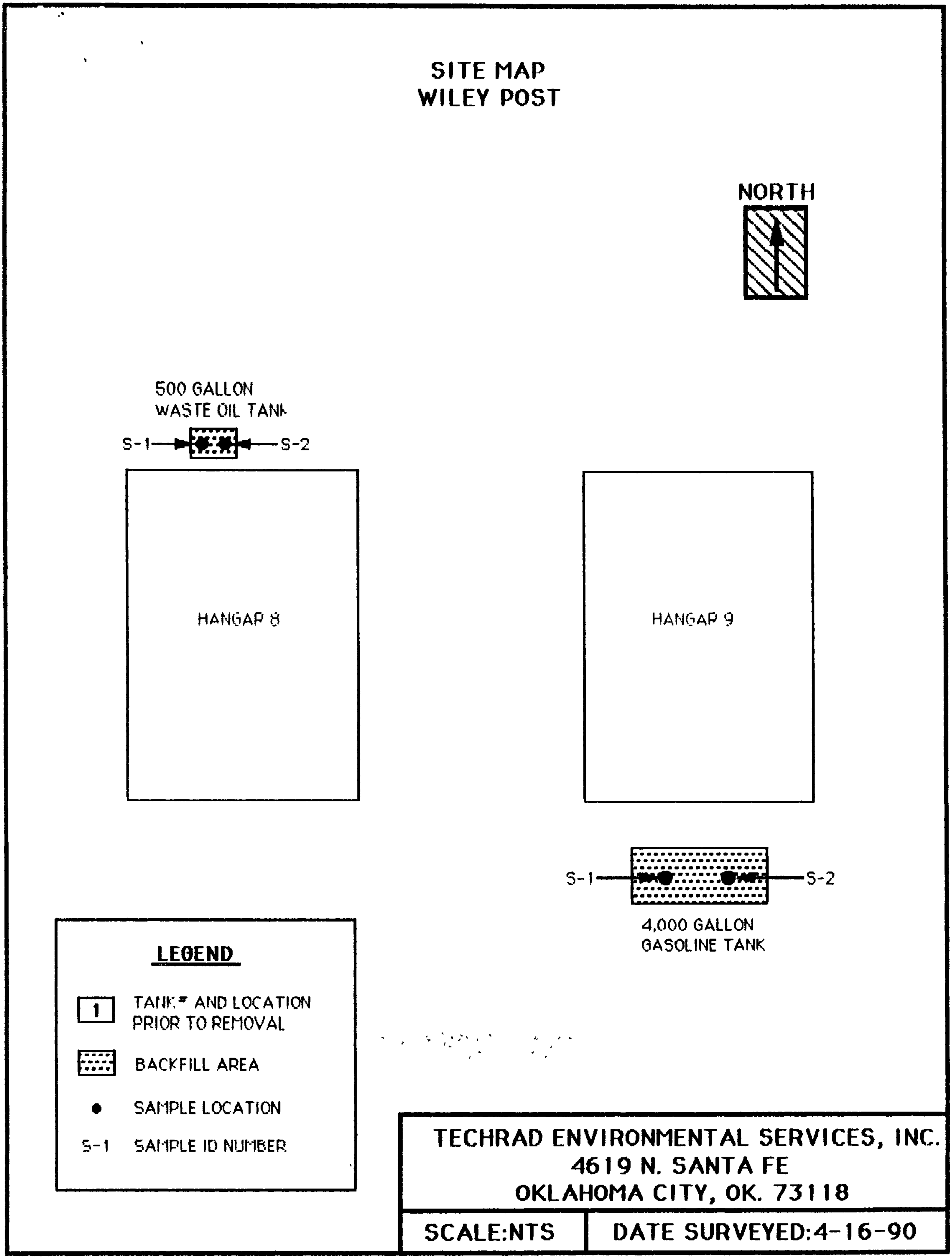
IDENTIFICATION: LAB NUMBER 9001845
SOIL SAMPLES
905-030 -WILEY POST AIRPORT, HANGER 3A, 5500 N. ROCKWELL
BETHANY, OK -WEST END OF UNLEAD TANK EXCAVATION

BTEX	
BENZENE	19,800 ug/kg
TOLUENE	20,800 ug/kg
ETHYLBENZENE	38,300 ug/kg
XYLENES (TOTAL)	82,300 ug/kg

DETECTION LIMIT 5.0 ug/kg
EPA METHOD: 8020 (SOIL)

Our letters and reports are for the exclusive use of the client to whom they are addressed. The use of our name must receive our prior written approval. Our letters and reports apply only to the sample tested and/or inspected, and are not indicative of the quantities of apparently identical or similar products
Unless notified in writing all samples are disposed of 15 days after the results are first reported.

REFERENCE 6


SITE MAP
WILEY POST
NORTH
500 GALLON
WASTE OIL TANK
S-1
S-2
HANGAR 8
HANGAR 9
S-1
S-2
4,000 GALLON
GASOLINE TANK
LEGEND
1 TANK # AND LOCATION PRIOR TO REMOVAL
BACKFILL AREA
SAMPLE LOCATION
S-1 SAMPLE ID NUMBER
TECHRAD ENVIRONMENTAL SERVICES, INC.
4619 N. SANTA FE
OKLAHOMA CITY, OK. 73118
SCALE:NTS
DATE SURVEYED:4-16-90

May 14, 1990

Ms. Tana Walker
Oklahoma Corporation Commission
2101 Lincoln Boulevard
Oklahoma City, OK 73159

RE: Underground Storage Tank Removal, Wiley Post Airport, Oklahoma City, Oklahoma

Dear Ms. Walker:

This letter references notification of removal of two underground storage tanks on April 5, 1990. The removal took place on April 16, 1990 and consisted of removing one (1) 500 gallon waste oil tank and one (1) 4,000 gallon gasoline tank owned by the Airport Trust Department, City of Oklahoma City.

The 4,000 gallon gasoline tank has been unused for eight (8) years prior to removal. The 500 gallon waste oil tank was in use at the time of removal.

A review of the site prior to excavation indicated no visual surface contamination. No groundwater was encountered in either backfill area during removal. Also, both backfill areas were lined with native clay soils with sand as the backfill material.

Both tanks were inspected after removal and one small pinhole was discovered at the bottom of the 500 gallon waste oil tank.

As shown in the attached laboratory report, the backfill material from the 500 gallon waste oil had petroleum hydrocarbon contamination levels in excess of the maximum allowable concentration. The contaminated backfill material was removed and taken to Laidlaw Landfill for disposal.

Soil samples were collected from the bottom of the waste oil tank backfill area after the contaminated soil was removed. Subsequent analyses indicated that the backfill area was below maximum contamination levels. Soil samples were collected from the bottom of the 4,000 gallon gasoline tank backfill area for analyses and were found to be below maximum allowable concentrations.

The excavated tanks were delivered to Admire Stone Company, Skiatook, Oklahoma for disposal. Attached are signed copies of the "Certification of Removal/Destruction" Form and the EPA Form 7530-1 "Notification for Underground Storage Tanks".

We appreciate your cooperation in the satisfactory completion of this project.

Sincerely,

TECHRAD Environmental Services, Inc.

Greg D. Wagoner
Environmental Specialist

GDW:kdt
Enclosures

TECHRAD ENVIRONMENTAL SERVICES, INC

4619 N Santa Fe Oklahoma City, OK 73118-7995 405/528-6224
6946 E 13th St. Tulsa, OK 74112 918/838-3590
FAX 405/528-3346

May 14, 1990

Airport Trust Department
Wiley Post Airport

REPORT OF ANALYSIS

SITE LOCATION: Hangar #8

DATE RECEIVED:	04/16/90	04/16/90	
LABORATORY NO:	901040	901041	
IDENTIFICATION:	500 Waste Oil Backfill Material	S.W./WO-1	
PARAMETERS			UNITS
TPH	5	5	mg/Kg

DATE RECEIVED:	04/16/90	04/23/90	
LABORATORY NO:	901042	901110	
IDENTIFICATION:	S.E./WO-2	500 Waste Oil S.E. Bottom	
PARAMETERS			UNITS
TPH	250	10	mg/Kg

Respectfully submitted,

TECHRAD Environmental Services, Inc.

Robert L. Naylor
Laboratory Manager

RLN:kdt

TECHRAD ENVIRONMENTAL SERVICES, INC

4619 N. Santa Fe Oklahoma City, OK 73118-7995 405/528-6224
6946 E. 13th St. Tulsa, OK 74112 918/838-3590
FAX 405/528-3346

May 14, 1990

Airport Trust Department
Wiley Post Airport

REPORT OF ANALYSIS

SITE LOCATION: Hangar #9

DATE RECEIVED:	04/17/90	04/17/90	04/17/90	
LABORATORY NO:	901043	901044	901045	
IDENTIFICATION:	4,000 Gas. Backfill Area	Bottom, Hole #1	Bottom, Hole #2	
PARAMETERS				UNITS
TPH	5	10	9	mg/Kg

Respectfully submitted,

TECHRAD Environmental Services, Inc.

Robert L. Naylor
Laboratory Manager

RLN:kdt

AFFIDAVIT -- CERTIFICATION OF REMOVAL
AND DESTRUCTION OF UNDERGROUND FUEL STORAGE TANKS

STATE OF OKLAHOMA)
ss
COUNTY OF OKLAHOMA)

Rick Seitsinger, of lawful age, being first duly sworn on oath says that (s) he is the agent of the contractor.

Affiant further certifies that: two underground storage tank (s) were removed from Wiley Post Airport in accordance with the requirements of the Oklahoma Corporation Commission

That these same two tank (s) were rendered unsuitable for future use as storage tank (s) by puncturing, cutting, or drilling numerous holes in all sections of each and every tank in accordance with the recommendations of the American Petroleum Institute's recommended practice 1604, second edition, "Removal and Disposal of Used Underground Petroleum Storage Tanks."

That these tanks were so rendered unsuitable for future use as storage tanks on or about April 18, 1990
(day of)

Subscribed and sworn to before me this 7th day of May 1990

Notary Public

My Commission Expires:

3-17-93

aff-cert/bh

6

RECEIVED APR - 9 1990

OKLAHOMA CORPORATION COMMISSION

OFFICE CORRESPONDENCE

DATE 4-5-90

TO

FROM Tom Springer

Telephone 405-521 2487

SUBJECT Tank Closure Inspection

You are requested to inspect a tank closure at the following location:

Name of location: Wiley Post
Address Hanger 8 City Bethany
Contact Person Greg Wagner Phone 528-7016
Address 4619 N Santa Fe City OKC 73118
Scheduled date of removal April 16 1990

Please complete the following and return to the writer for filing or further action:

1. Number of tanks 1
2. Size of tanks 1000 gal
3. Tanks closed in place ______ or removed ______
4. Results of site assessment
   a. Sample and results taken where contamination is likely to occur ______ (Y, N)
   b. Type of testing - Soil gas ______: water ______
      Name of Test Lab ______
   c. Sampling by ______ Company ______
      NOTE: If tank is closed in place, results of testing must be available before tank is filled.
5. Was ground water encountered ______
6. Was tank cleaned on site ______
7. If tank residues and sludges are to be removed from the tank at another location, where will tank be taken?
   Address ______ City ______
   NOTE: Inspector will make follow up inspection to confirm tank is cleaned properly.

*Note to UST Contact Person:

1. Results of sampling are to be submitted in writing to the Commission within 30 days.
2. If closure date is changed, owner MUST coordinate new date with the inspector at above telephone number.

Comments ______

Signed (Inspector) ______

cc: UST Owner or Representative Greg
Facility File ______

Revised 1-24-90

RECEIVED MAY 24 1990

Joan K. Leavitt, M.D.
Commissioner

OKLAHOMA STATE DEPARTMENT OF HEALTH
P.O. BOX 53551
1000 NE TENTH
OKLAHOMA CITY, OK 73152

May 22, 1990

Earlie Knox
LAIDLAW LANDFILL
7001 S. Bryant
Oklahoma City, Oklahoma 73149

Dear Sir:

Wiley Post Airport of Oklahoma City has generated approximately 20 cubic yards of soil contaminated by gasoline. This material, which resulted from the removal of an underground storage tank, has been classified as a non-hazardous waste and may be disposed of in your landfill.

You may incorporate this waste in your disposal activities in an environmentally safe manner. It is our understanding that Greg Wagoner of Techrad has contacted you regarding disposal.

This approval is based on the information supplied to the Department. It does not relieve the generator or disposal site of any liability for incorrectly classified waste, nor for any environmental damage it might cause.

If you have any questions on this matter, please call me at (405) 271-7159.

Sincerely,

Dennis J. Hrebec

Dennis J. Hrebec, PhD.
Acting Director
Solid Waste Division

DJH/nhb

cc: Karen Hrbacek, RS, Oklahoma City/County Health Department
Jim Austin, RS, Chief, Environmental Health Service

Greg D. Wagoner
TECHRAD ENVIRONMENTAL SERVICES, INC.
4619 N. Santa Fe
Oklahoma City, Oklahoma 73118-7995

LAIDLAW

SPECIAL WASTE ACCEPTANCE APPLICATION

Generator Name: City of Oklahoma City

Address: Department of Airports
Wiley Post Airport

Telephone: ( ) ________

Generator Contact: Mr. Wayne Fuller

Laidlaw Facility: S.E. Landfill

Location: 7001 S. Bryant, Okla. City, OK

Division Mgr.: ________

Waste Quantities: 20 Units: Cubic Yds ☒ Tons ☐ Drums ☐

Frequency of Receipt: Daily ☐ Weekly ☐ Monthly ☒ One Time

Other ☐ ________

General Material Description: Hydrocarbon contaminated soil from UST removal

Process Generating Waste: ________

Physical Properties:
Physical State at 70°F Solid ☒ Semisolid ☐ Liquid ☐ Density 2000 #/CY
Color Brown Viscosity N.A. Low ☐ Medium ☐ High ☐ Flash Point >100 °C
Odor Yes ☐ No ☒ Water Content <5 % by Weight
Paint Filter Test: Passed ☒ Failed ☐ Reactive: Yes ☐ No ☒ With ________
Waste pH 6.8 Infectious Yes ☐ No ☒

Chemical Properties: (MG/Liter)
(EP. Toxicity Test)

Arsenic	0.007	Barium	0.83	Cadmium	0.01	Chromium	<0.05	Lead	<0.05
Mercury	<0.0005	Selenium	0.01	Silver	<0.01	Endrin	N.A.	Lindane	N.A.
Methoxychlor	N.A	Toxaphene	N.A.	2,4-D	N.A.	2,4,5-TP Silvex	N.A.		

(Chemical Composition)

Other Information:
Delivery Method: Bulk ☒ Drum ☐ Other ☐ ________
Regulatory Agency Approval Received: Yes ☒ No ☐ Permit No. Attached Letter
Material Safety Data Sheet Provided: Yes ☐ No ☐

LABORATORY CERTIFICATION

To the best of my knowledge, the above listed material is not classified as a hazardous waste in accordance with current regulations.
Laboratory TECHRAD By R L Naylor

GENERATOR CERTIFICATION

To the best of my knowledge, the information provided above is accurate and the material is not classified as a hazardous waste in accordance with current regulations.
Authorized Representative R L Naylor Date 7/5/90

LAIDLAW WASTE SYSTEM APPROVAL

1. Division Mgr. ________ Date ________
2. District Mgr. ________ Date ________
3. Regional Engineer ________ Date ________
4. Regional V.P. ________ Date ________
5. V.P. Engineering ________ Date ________

Notification for Underground Storage Tanks

FORM APPROVED
OMB NO. 2050-0049
APPROVAL EXPIRES 6-30-88

FOR TANKS IN OK

RETURN COMPLETED FORM TO Underground Storage Tank Program
Oklahoma Corporation Commission
Jim Thorpe Building
Oklahoma City, OK 73105

STATE USE ONLY
I D Number
Date Received

GENERAL INFORMATION

Notification is required by Federal law for all underground tanks that have been used to store regulated substances since January 1, 1974, that are in the ground as of May 8, 1986, or that are brought into use after May 8, 1986 The information requested is required by Section 9002 of the Resource Conservation and Recovery Act, (RCRA), as amended.

The primary purpose of this notification program is to locate and evaluate underground tanks that store or have stored petroleum or hazardous substances It is expected that the information you provide will be based on reasonably available records, or, in the absence of such records your knowledge belief or recollection

Who Must Notify? Section 9002 of RCRA as amended requires that unless exempted, owners of underground tanks that store regulated substances must notify designated State or local agencies of the existence of their tanks Owner means -

(a) in the case of an underground storage tank in use on November 8 1984, or brought into use after that date, any person who owns an underground storage tank used for the storage use, or dispensing of regulated substances and

(b) in the case of any underground storage tank in use before November 8 1984 but no longer in use on that date any person who owned such tank immediately before the discontinuation of its use

What Tanks Are Included? Underground storage tank is defined as any one or combination of tanks that (1) is used to contain an accumulation of "regulated substances," and (2) whose volume (including connected underground piping) is 10% or more beneath the ground Some examples are underground tanks storing 1. gasoline used oil, or diesel fuel and 2. industrial solvents, pesticides herbicides or fumigants

What Tanks Are Excluded? Tanks removed from the ground are not subject to notification Other tanks excluded from notification are

1. farm or residential tanks of 1 100 gallons or less capacity used for storing motor fuel for noncommercial purposes.
2. tanks used for storing heating oil for consumptive use on the premises where stored.
3. septic tanks
4. pipeline facilities (including gathering lines) regulated under the Natural Gas Pipeline Safety Act of 1968 or the Hazardous Liquid Pipeline Safety Act of 1979 or which is an intrastate pipeline facility regulated under State laws
5. surface impoundments, pits, ponds, or lagoons.
6. storm water or waste water collection systems.
7. flow-through process tanks
8. liquid traps or associated gathering lines directly related to oil or gas production and gathering operations
9. storage tanks situated in an underground area (such as a basement cellar mineworking drift, shaft or tunnel) if the storage tank is situated upon or above the surface of the floor

What Substances Are Covered? The notification requirements apply to underground storage tanks that contain regulated substances This includes any substance defined as hazardous in section 101 (14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), with the exception of those substances regulated as hazardous waste under Subtitle C of RCRA It also includes petroleum, e g , crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14 7 pounds per square inch absolute)

Where To Notify? Completed notification forms should be sent to the address given at the top of this page

When To Notify? 1. Owners of underground storage tanks in use or that have been taken out of operation after January 1 1974 but still in the ground must notify by May 8, 1986 2 Owners who bring underground storage tanks into use after May 8 1986 must notify within 30 days of bringing the tanks into use

Penalties: Any owner who knowingly fails to notify or submits false information shall be subject to a civil penalty not to exceed $10,000 for each tank for which notification is not given or for which false information is submitted.

INSTRUCTIONS

Please type or print in ink all items except "signature" in Section V **This form must by completed for each location containing underground storage tanks.** If more than 5 tanks are owned at this location, photocopy the reverse side, and staple continuation sheets to this form

Indicate number of continuation sheets attached [ ]

I. OWNERSHIP OF TANK(S)

Owner Name (Corporation, Individual Public Agency or Other Entity)
Airport Trust Department

Street Address
P.O. Box 59937

County
Oklahoma

City: Oklahoma City — State: Oklahoma — ZIP Code: 73159

Area Code Phone Number
405-681-5311

Type of Owner (*Mark all that apply* [X])

- [X] Current
- [ ] Former
- [X] State or Local Gov't
- [ ] Federal Gov't (GSA facility I.D no ________)
- [ ] Private or Corporate
- [ ] Ownership uncertain

II. LOCATION OF TANK(S)

(If same as Section 1, mark box here [X])

Facility Name or Company Site Identifier, as applicable

Street Address or State Road, as applicable

County

City (nearest) State ZIP Code

Indicate number of tanks at this location (2)

Mark box here if tank(s) are located on land within an Indian reservation or on other Indian trust lands [ ]

III. CONTACT PERSON AT TANK LOCATION

Name (If same as Section I, mark box here [X]) Job Title Area Code Phone Number

IV. TYPE OF NOTIFICATION

[ ] Mark box here only if this is an amended or subsequent notification for this location

V. CERTIFICATION (Read and sign after completing Section VI.)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete

Name and official title of owner or owner's authorized representative	Signature	Date Signed
Greg Wagoner Environmental Specialist	[signature]	5-7-90

CONTINUE ON REVERSE SIDE

Owner Name (from Section I) ______ Location (from Section II) ______ Page No. ____ of ____ Pages

VI. DESCRIPTION OF UNDERGROUND STORAGE TANKS *(Complete for each tank at this location.)*

Tank Identification No. (e.g., ABC-123), or Arbitrarily Assigned Sequential Number (e.g., 1,2,3...)	Tank No. 1	Tank No. 2	Tank No.	Tank No.	Tank No.
1. Status of Tank *(Mark all that apply ☒)*					
Currently in Use					
Temporarily Out of Use					
Permanently Out of Use	X	X			
Brought into Use after 5/8/86					
2. Estimated Age (Years)	unknown	unknown			
3. Estimated Total Capacity (Gallons)	500	4,000			
4. Material of Construction *(Mark one ☒)*					
Steel	X	X			
Concrete					
Fiberglass Reinforced Plastic					
Unknown					
Other, Please Specify					
5. Internal Protection *(Mark all that apply ☒)*					
Cathodic Protection					
Interior Lining (e.g., epoxy resins)					
None	X	X			
Unknown					
Other, Please Specify					
6. External Protection *(Mark all that apply ☒)*					
Cathodic Protection					
Painted (e.g., asphaltic)					
Fiberglass Reinforced Plastic Coated					
None	X	X			
Unknown					
Other, Please Specify					
7. Piping *(Mark all that apply ☒)*					
Bare Steel	X	X			
Galvanized Steel					
Fiberglass Reinforced Plastic					
Cathodically Protected					
Unknown					
Other, Please Specify					
8. Substance Currently or Last Stored in Greatest Quantity by Volume *(Mark all that apply ☒)*					
a. Empty					
b. Petroleum					
Diesel					
Kerosene					
Gasoline (including alcohol blends)		X			
Used Oil	X				
Other, Please Specify					
c. Hazardous Substance					
Please Indicate Name of Principal CERCLA Substance OR					
Chemical Abstract Service (CAS) No.					
Mark box ☒ if tank stores a mixture of substances					
d. Unknown					
9. Additional Information (for tanks permanently taken out of service)					
a. Estimated date last used (mo/yr)	04 / 90	/ 1982	/	/	/
b. Estimated quantity of substance remaining (gal.)					
c. Mark box ☒ if tank was filled with inert material (e.g., sand, concrete)					

Both tanks permenantly removed from service

TECHRAD ENVIRONMENTAL SERVICES, INC

4619 N. Santa Fe — Oklahoma City, OK 73118-7995 — 405/528-7016
6946 E. 13th St. — Tulsa, OK 74112 — 918/838-3590
FAX 405/528-3346

May 16, 1990

Oklahoma City Department of Airports
Wiley Post Airport
Hangar #8

REPORT OF ANALYSIS

DATE RECEIVED:	04/25/90	04/25/90	04/25/90	
LABORATORY NO:	901128	901127	901128	
IDENTIFICATION:	West Bottom	East Bottom	Backfill Material	
PARAMETERS				UNITS
TPH	40	50	46	mg/Kg
E.P. EXTRACTION				
Arsenic	--	--	7	ug/L
Barium	--	--	0.83	mg/L
Cadmium	--	--	0.01	mg/L
Chromium	--	--	<0.05	mg/L
Lead	--	--	<0.05	mg/L
Mercury	--	--	<0.5	ug/L
Selenium	--	--	0.01	mg/L
Silver	--	--	<0.01	mg/L
TOX	--	--	<10	mg/Kg

Respectfully submitted,

TECHRAD Environmental Services, Inc.

R L Naylor

Robert L. Naylor
Laboratory Manager

RLN:kdt

TECHRAD ENVIRONMENTAL SERVICES, INC.

4619 N. Santa Fe Oklahoma City, OK 73118-7995 405/528-6224
6946 E. 13th St. Tulsa, OK 74112 918/838-3590
FAX 405/528-3346

May 16, 1990

Mr. Dennis Hrebec
Oklahoma State Department of Health
P.O. Box 53551
Oklahoma City, OK 73152

Dear Mr. Hrebec:

This letter is a request for approval by the Oklahoma State Department of Health to dispose hydrocarbon contaminated soil.

The soil is from a tank removal at the Wiley Post Airport, Oklahoma City, Oklahoma. The soil will be disposed at the Laidlaw Southeast Landfill, 7001 South Bryant, Oklahoma City, Oklahoma.

We have enclosed a copy of our laboratory analysis on a composite sample of the soil. We estimate that there will be 20 cubic yards of soil.

Thank you for your assistance in this matter. Please call if you require further information.

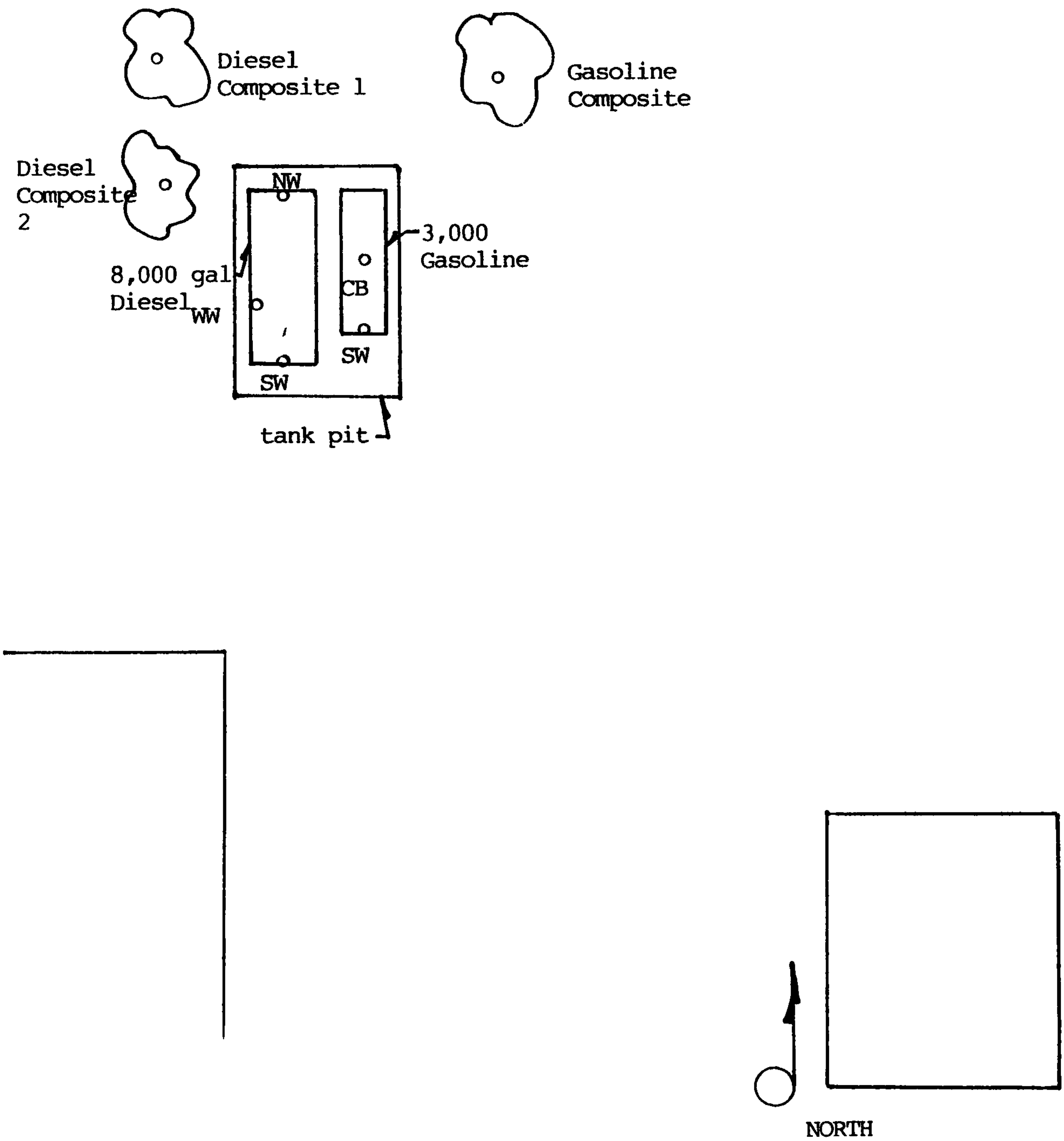
Sincerely,

TECHRAD Environmental Services, Inc.

Greg D. Wagoner
Environmental Specialist

GDW:kdt
Enclosure

REFERENCE 7



WILEY POST MAIN FUEL SUPPLY
SITE MAP

SCALE
NTS

TECHRAD ENVIRONMENTAL SERVICES, INC

4619 N Santa Fe Oklahoma City, OK 73118-7995 405/528-7016
6946 E 13th St. Tulsa, OK 74112 918/838-3590
FAX 405/528-3346

January 22, 1991

Mr. Wayne Fuller
Wiley Post Airport Manager
Wiley Post Airport
5400 N. Rockwell
Oklahoma City, Oklahoma

REPORT OF ANALYSIS

SITE LOCATION: Wiley Post Airport

DATE RECEIVED:	01/15/91	01/15/91	01/15/91	
LABORATORY NO:	910128	910129	910130	
IDENTIFICATION:	Composite #1/Diesel	Composite #2/Diesel	South Well Diesel	
PARAMETERS				**UNITS**
TPH	<0.1	<0.1	<0.1	mg/Kg

DATE RECEIVED:	01/15/91	01/15/91	
LABORATORY NO:	910131	910132	
IDENTIFICATION:	North Wall Diesel	West Wall Diesel	
PARAMETERS			**UNITS**
TPH	<0.1	<0.1	mg/Kg

Mr. Wayne Fuller
Wiley Post Airport Manager
Wiley Post Airport
January 22, 1991
Page Two

REPORT OF ANALYSIS

SITE LOCATION: Wiley Post Airport

DATE RECEIVED:	01/15/91	01/15/91	01/15/91	
LABORATORY NO:	910114	910115	910116	
IDENTIFICATION:	Composite from Back-fill/Gaso-line	South Wall Gasoline	Center Bottom Gasoline	
PARAMETERS				**UNITS**
Benzene	<0.04	<0.04	<0.04	mg/Kg
Toluene	<0.04	<0.04	<0.04	mg/Kg
Ethylbenzene	<0.04	<0.04	<0.04	mg/Kg
Xylene	<0.04	<0.04	<0.04	mg/Kg
TPH	<0.1	<0.1	<0.1	mg/Kg

Respectfully submitted,

TECHRAD Environmental Services, Inc.

RL Naylor

Robert L. Naylor
Laboratory Manager

RLN:kdt

ADMIRE CONSTRUCTION INC.
P.O. BOX 27 14321 N. CINCINNATI
SKIATOOK, OK. 74070 918-396-4910

AFFIDAVIT--CERTIFICATION OF REMOVAL
AND DESTRUCTION OF UNDERGROUND FUEL STORAGE TANKS

STATE OF OKLAHOMA)
) ss.
COUNTY OF Oklahoma)

Rick Seitsinger, of lawful age, being first duly sworn on oath says that (s)he is the agent of the contractor.

Affiant further certifies that: two (2) underground storage tank(s) was/were removed from Wiley Post Airport in accordance with the requirements of Oklahoma Corporation Commission.

That ~~this~~/these same two (2) tank(s) was/were rendered unsuitable for future use as storage tank(s) by puncturing, cutting, or drilling numerous holes in all sections of each and every tank in accordance with the recommendations of the American Petroleum INstitute's recommended practice 1604, second edition, "Removal and Disposal of Used Underground Petroleum Storage Tanks."

That this/these tank(s) was/were so rendered unsuitable for future use as storage tank(s) on or about Jaunary 15, 1991.
(date)

(Signature)

Subscribed and sworn to before me this ______day of ______________, 19__________.

Notary Public

My Commission Expires:

Notification for Underground Storage Tanks

FORM APPROVED
OMB NO. 2050-0049
APPROVAL EXPIRES 6-30-88

FOR TANKS IN **OK**

RETURN COMPLETED FORM TO
Underground Storage Tank Program
Oklahoma Corporation Commission
Jim Thorpe Building
Oklahoma City, OK 73105

STATE USE ONLY
I D Number
Date Received

GENERAL INFORMATION

Notification is required by Federal law for all underground tanks that have been used to store regulated substances since January 1, 1974, that are in the ground as of May 8, 1986, or that are brought into use after May 8, 1986. The information requested is required by Section 9002 of the Resource Conservation and Recovery Act, (RCRA), as amended.

The primary purpose of this notification program is to locate and evaluate underground tanks that store or have stored petroleum or hazardous substances. It is expected that the information you provide will be based on reasonably available records, or, in the absence of such records, your knowledge, belief, or recollection.

Who Must Notify? Section 9002 of RCRA, as amended, requires that, unless exempted, owners of underground tanks that store regulated substances must notify designated State or local agencies of the existence of their tanks. Owner means—

(a) in the case of an underground storage tank in use on November 8, 1984, or brought into use after that date, any person who owns an underground storage tank used for the storage, use, or dispensing of regulated substances, and

(b) in the case of any underground storage tank in use before November 8, 1984, but no longer in use on that date, any person who owned such tank immediately before the discontinuation of its use.

What Tanks Are Included? Underground storage tank is defined as any one or combination of tanks that (1) is used to contain an accumulation of "regulated substances," and (2) whose volume (including connected underground piping) is 10% or more beneath the ground. Some examples are underground tanks storing: 1. gasoline, used oil, or diesel fuel, and 2. industrial solvents, pesticides, herbicides or fumigants.

What Tanks Are Excluded? Tanks removed from the ground are not subject to notification. Other tanks excluded from notification are:

1. farm or residential tanks of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes.
2. tanks used for storing heating oil for consumptive use on the premises where stored.
3. septic tanks.
4. pipeline facilities (including gathering lines) regulated under the Natural Gas Pipeline Safety Act of 1968, or the Hazardous Liquid Pipeline Safety Act of 1979, or which is an intrastate pipeline facility regulated under State laws.
5. surface impoundments, pits, ponds, or lagoons.
6. storm water or waste water collection systems.
7. flow-through process tanks.
8. liquid traps or associated gathering lines directly related to oil or gas production and gathering operations.
9. storage tanks situated in an underground area (such as a basement, cellar, mineworking, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor.

What Substances Are Covered? The notification requirements apply to underground storage tanks that contain regulated substances. This includes any substance defined as hazardous in section 101 (14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), with the exception of those substances regulated as hazardous waste under Subtitle C of RCRA. It also includes petroleum, e.g., crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute).

Where To Notify? Completed notification forms should be sent to the address given at the top of this page.

When To Notify? 1. Owners of underground storage tanks in use or that have been taken out of operation after January 1, 1974, but still in the ground, must notify by May 8, 1986. 2. Owners who bring underground storage tanks into use after May 8, 1986, must notify within 30 days of bringing the tanks into use.

Penalties: Any owner who knowingly fails to notify or submits false information shall be subject to a civil penalty not to exceed $10,000 for each tank for which notification is not given or for which false information is submitted.

INSTRUCTIONS

Please type or print in ink all items except "signature" in Section V. **This form must by completed for each location containing underground storage tanks.** If more than 5 tanks are owned at this location, photocopy the reverse side, and staple continuation sheets to this form.

Indicate number of continuation sheets attached: ☐

I. OWNERSHIP OF TANK(S)

Owner Name (Corporation, Individual, Public Agency, or Other Entity): Department of Airports

Street Address: P.O. Box 59941

County: Oklahoma

City: Oklahoma City, State: Oklahoma ZIP Code: 73159

Area Code / Phone Number:

Type of Owner (*Mark all that apply* ☒)

- ☒ Current
- ☐ Former
- ☐ State or Local Gov't
- ☐ Federal Gov't (GSA facility I D no ______)
- ☐ Private or Corporate
- ☐ Ownership uncertain

II. LOCATION OF TANK(S)

(If same as Section 1, mark box here ☐)

Facility Name or Company Site Identifier, as applicable: Wiley Post Airport

Street Address or State Road, as applicable: 5700 North Rockwell

County: Oklahoma

City (nearest): Bethany State: Oklahoma ZIP Code: 73108

Indicate number of tanks at this location: 2

Mark box here if tank(s) are located on land within an Indian reservation or on other Indian trust lands ☐

III. CONTACT PERSON AT TANK LOCATION

Name (If same as Section I, mark box here ☐)	Job Title	Area Code	Phone Number
Mr. Wayne Fuller	G.A. Manager	(405)	789-3515

IV. TYPE OF NOTIFICATION

☐ Mark box here only if this is an amended or subsequent notification for this location

V. CERTIFICATION (Read and sign after completing Section VI.)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete

Name and official title of owner or owner's authorized representative	Signature	Date Signed
Dan S. Spitz-Hydrogeologist (representative)		4-1-91

CONTINUE ON REVERSE SIDE

Owner Name (from Section I) ______ Location (from Section II) ______ Page No. ____ of ____ Pages

VI. DESCRIPTION OF UNDERGROUND STORAGE TANKS *(Complete for each tank at this location.)*

Tank Identification No. (e.g., ABC-123), or Arbitrarily Assigned Sequential Number (e.g., 1,2,3...)	Tank No. 1	Tank No. 2	Tank No.	Tank No.	Tank No.
1. Status of Tank *(Mark all that apply ☒)*					
Currently in Use	☐	☐	☐	☐	☐
Temporarily Out of Use	☐	☐	☐	☐	☐
Permanently Out of Use	X	X	☐	☐	☐
Brought into Use after 5/8/86	☐	☐	☐	☐	☐
2. Estimated Age (Years)	unknown	unknown			
3. Estimated Total Capacity (Gallons)	3,000	8,000			
4. Material of Construction *(Mark one ☒)*					
Steel	X	X	☐	☐	☐
Concrete	☐	☐	☐	☐	☐
Fiberglass Reinforced Plastic	☐	☐	☐	☐	☐
Unknown	☐	☐	☐	☐	☐
Other, Please Specify					
5. Internal Protection *(Mark all that apply ☒)*					
Cathodic Protection	☐	☐	☐	☐	☐
Interior Lining (e.g., epoxy resins)	☐	☐	☐	☐	☐
None	☐	☐	☐	☐	☐
Unknown	X	X	☐	☐	☐
Other, Please Specify					
6. External Protection *(Mark all that apply ☒)*					
Cathodic Protection	☐	☐	☐	☐	☐
Painted (e.g., asphaltic)	☐	☐	☐	☐	☐
Fiberglass Reinforced Plastic Coated	☐	☐	☐	☐	☐
None	☐	☐	☐	☐	☐
Unknown	X	X	☐	☐	☐
Other, Please Specify					
7. Piping *(Mark all that apply ☒)*					
Bare Steel	X	X	☐	☐	☐
Galvanized Steel	☐	☐	☐	☐	☐
Fiberglass Reinforced Plastic	☐	☐	☐	☐	☐
Cathodically Protected	☐	☐	☐	☐	☐
Unknown	☐	☐	☐	☐	☐
Other, Please Specify					
8. Substance Currently or Last Stored in Greatest Quantity by Volume *(Mark all that apply ☒)*					
a. Empty	☐	☐	☐	☐	☐
b. Petroleum					
Diesel	☐	X	☐	☐	☐
Kerosene	☐	☐	☐	☐	☐
Gasoline (including alcohol blends)	X	☐	☐	☐	☐
Used Oil	☐	☐	☐	☐	☐
Other, Please Specify					
c. Hazardous Substance	☐	☐	☐	☐	☐
Please Indicate Name of Principal CERCLA Substance					
OR Chemical Abstract Service (CAS) No.					
Mark box ☒ if tank stores a mixture of substances	☐	☐	☐	☐	☐
d. Unknown	☐	☐	☐	☐	☐
9. Additional Information (for tanks permanently taken out of service)					
a. Estimated date last used (mo/yr)	12 / 90	12 / 90	/	/	/
b. Estimated quantity of substance remaining (gal.)	0	0			
c. Mark box ☒ if tank was filled with inert material (e.g., sand, concrete)	☐	☐	☐	☐	☐

REFERENCE 8

ICF

1509 Main Street, Suite 900
Dallas, Texas
75201-4809

214/744-1641

ICF TECHNOLOGY INCORPORATED

TO: David Wineman, Region VI RPO

THRU: K. H. Malone Jr., FITOM

THRU: Tim Hall, AFITOM TAH.

FROM: Ravinder Joseph, FIT Environmental Engineer

DATE: May 20, 1988

SUBJECT: Sampling Inspection At Air Center, Oklahoma City, OK (OKD 980750319)
TDD # F-6-8711-04
PAN NO: F0K0270SBF

During the week of January 4, 1988, a six member FIT team (Ravinder Joseph, John Jones, Keith Wheeler, Jeff Robinson, Steve Cowan, and Heather Schijf) conducted soil/sediment, subsurface soil and surface water sampling at Air Center, OK. The site is located at 7300 NW (Northwest) 63rd, Wiley Post Airport in Oklahoma City. The site was formerly used as an aircraft stripping and painting facility. Waste generated from the stripping process was allowed to drain into an unlined lagoon where it then entered a drainage ditch and eventually flowed into a residential pond enclosed by the Woodlake residential district. The lagoon was later filled. FIT discovered the presence of two underground storage tanks on-site during a site recon on July 23, 1987. These tanks were used to hold stripped paint sludge. When full, the tanks were pumped dry into a tanker truck and transported to a disposer in Kansas City. The tanks were dry at closure and later pumped dry again by Wiley Post authorities at an undetermined date. Sampling at Air Center was conducted to detect the presence (if any) of heavy metals such as chromium & lead, and organics such as methylene chloride and phenols.

One background surface soil sample at one foot and another background subsurface soil sample at six feet were collected on-site. One off-site background surface soil sample at one foot was also collected.

Off-site sediment/water samples were taken to determine if there is migration of contaminants into Woodlake Pond. Drinking water wells upgradient and downgradient of Air Center were also sampled for possible contamination. The upgradient well is located three miles to the northwest of the site. The other drinking water wells are to the southwest of the site within half a mile and three miles from Air Center.

All surface soil and sediment samples on-site were collected with stainless steel trowels which had been deconned with TSP and detergent and rinsed with deionized water. Trowels used at a particular location were not reused again. Subsurface soil samples were taken at a depth of five to six feet. A mobile power drill was used to drill to the required depth. The subsurface samples were collected using a two inch auger and then transferred with a trowel into the sample bottles. Water samples from the underground storage tank on-site were collected using a two inch stainless steel bailer which had been previously deconned with TSP and detergent and then rinsed with deionized water. Surface water samples from the drainage area and pond were collected with a stainless steel beaker which had been deconned in the manner stated above. The surface water samples off-site, from Woodlake Pond, were taken using a stainless steel beaker at the end of an extension pole. All drinking water well samples were collected directly into the sample bottle from spigots or from connections close to the well . The wells were purged by allowing them to flow till pH and conductivity measurements stabilized. The results of field measurements of pH and conductivity are presented in Table VI.

Weather during the sampling mission was cold with temperatures around 21°F. It snowed during the days the on-site samples were taken. There was about one foot of snow accumulation on the ground. Subsurface drilling was monitored with an HNu. HNu readings as high as 50 ppm were recorded down the hole. However, since the meter readings were erratic because of weather conditions, no definite conclusions could be drawn from them. Surface water samples and sediment samples along the drainage path were taken after breaking through an ice layer. This had to be done both on-site and off-site at Woodlake Pond.

The breakdown of the sampling is as follows:

Surface Soil/Sediment	On-Site	13	samples	1 Duplicate	
Sub Surface Soil	On-Site	4	samples	1 Duplicate	QA/QC
Surface Water	On-Site	2	samples	1 Duplicate	QA/QC
Soil/Sediment	Off-Site	10	samples	1 Duplicate	QA/QC
Surface Water	Off-Site	1	sample		QA/QC
Drinking Water Wells	Off-Site	5	samples	1 Duplicate	QA/QC
Field Blank		1	sample		

Summary Of Analytical Results

(Refer to Tables I, II, IIA, IV, and V) The analytical results indicate that for many contaminants, especially organics, the concentration values had J Flags next to them. J Flags indicate that the sample concentrations are to be only considered as estimates. In the discussion given below, concentration values for contaminants without J Flags next to them indicate true concentrations.

Organics

Phenol was not detected in the one-foot and six-foot background soil samples on-site. It was, however, detected at concentrations of 46J (ppb) and 62J (ppb) (duplicate) in water from the underground storage tank on-site. These tanks were at one time used to store stripper sludge from aircraft painting operations. Phenol was also detected in soil at the mouth of the drainage ditch (Map Location 20) at concentrations of 2200J (ppb) and 3500J (ppb). Phenol at 10,000J (ppb) was also found at the mouth of the drainage ditch opening into the upper pond (map location 13). Phenol was also detected at 1200J (ppb) off-site in the background soil sample collected at Woodlake Pond. Even though this was found only in the background sample, on the bank of the lake (map location 24), it is possible to account for its presence if the pond had overflowed its banks at some point in time or the lake had been dredged and the sediment piled up on the banks. However, since these are only estimates (J Flag), there is uncertainty associated with these values.

Samples taken from the underground storage tank indicate xylene at 41J (ppb) and 47J (ppb) and 2 methyl naphthalene at 35J (ppb) and 45J (ppb). Xylene was not found in the on-site background soil samples.

Bis (2-Ethyl hexyl phthalate) at 110 ppb (J Flag) and 220 ppb (J Flag) was found near the concrete drainage pipe on-site (map location 20). This compound was also found in the City of Bethany municipal drinking water well #23 (map location 28) at concentrations of 28 ppb and 9 ppb (duplicate). This well is located three quarters of a mile west of the site. However, since this is a common laboratory contaminant no significance can be attached to these values.

Inorganics

Arsenic was detected (5 ppb) in water found in one of the underground storage tanks. It was detected in the background on-site soil sample in concentrations comparable to those found in soil elsewhere on the site. These are only estimates (J Flag). Arsenic was also detected at 4 ppb in the City of Bethany municipal well #21 located one and a half miles west of the site. However, this is much lower than the primary drinking water standard of 50 ppb.

Chromium was not found in the underground storage tank but was found in the background soil samples at the one foot and six feet levels (9.8J (ppm) and 18.3J (ppm). However, these are only estimates. It was also detected in water leaving the site through the drainage ditch (28 ppb). It was detected off-site at map locations 1,2,3,4,5,6,7,8, & 9 in concentrations ranging from 12.9 ppm to 41.1 ppm. However, these are again only estimates. Chromium was also found in the off-site background sample at 28 ppm (J Flag) and in the City of Bethany municipal drinking water well #21 at 15 ppb (Primary drinking water standard: 50 ppb).

Lead was detected in the background soil samples on-site at concentrations of 9.9 and 6.9 ppm. It was also found in all the soil samples off-site in ppm levels ranging from 6.5 ppm to 33 ppm. The background off-site soil sample had a concentration of 22 ppm. The concentrations of lead in drinking water wells (City of Bethany well #21 & #23 - 176 ppb and 66 ppb) are significantly higher than the primary drinking water standard of 50 ppb.

The on-site background soil sample contained nickel (11.6 ppm and 27.3 ppm) which was also detected at map locations 18, 14, 20, & 15 in comparable concentrations. It was found in all the sediment samples, including the background soil at concentrations ranging from 12.9 to 39.5 ppm. Nickel was detected at 31 ppb in the underground storage tank.

Zinc was found in the on-site and background soil samples at depths of one foot and 6 feet (22.8 ppm & 35 ppm) and in the off-site sample at Woodlake Pond (55.8 ppm). Zinc was detected in water in the underground storage tank at 18 ppb & 25 ppb and was also in all the soil and water samples on-site. Significantly higher concentrations than background were found at map locations 20, 13, 12 & 11. Zinc was also found in the water at map location

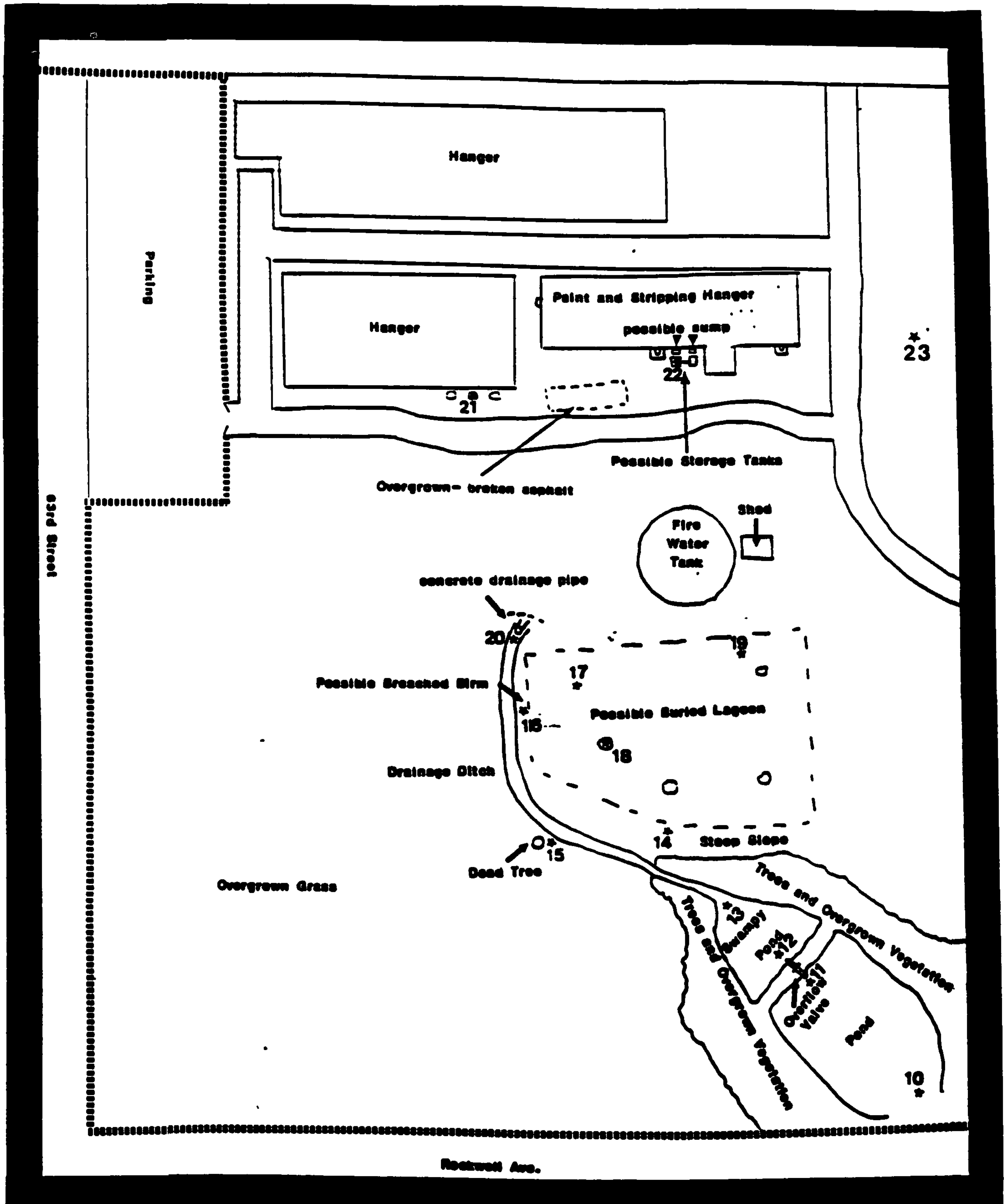
10 (27 ppb) and in all the off-site soil samples. It also was present at a significantly higher concentration in municipal well #23 (338 ppb), and in the background well at a concentration of 43 ppb.

Cyanide was not detected in background samples but was detected in the water in the underground storage tank (12 ppb & 11 ppb) and in soil at map locations 20 (4.7 & 3 ppb), 15 (5 ppb) and 13 (78.2 ppb). These values are considered significant since it was not found in the background on-site soil samples. Cyanide was not detected off-site.

The results of the sampling mission appear to indicate the presence of phenols and cyanides at the mouth of the drainage ditch on-site (map location 20) and further downstream at the on-site pond (map location 13). Phenol and cyanide were not detected in the background soil samples on-site but were present in the underground storage tank. Cyanide was also present at map location 15. Phenol was also found off-site at map location 24. Even though the concentration values associated with phenol are only estimates (J Flags), these estimates are considered to be biased low and as such do indicate the presence of these components at the above location. Both phenols and cyanides are commonly used in solvents, metal cleaning fluids and plating baths. These fluids are commonly used in activities with which Air Center was involved.

FIT recommends that the City of Bethany's water superintendent and the Oklahoma State Department of Health be informed about the presence of lead in the City of Bethany municipal well no. 21 and well no. 23. The concentration of lead in these wells (176 ppb and 66 ppb) are above the primary drinking water standard of 50 ppb.

FIT also recommends RCRA and state UST program be informed of the underground storage tanks on-site.

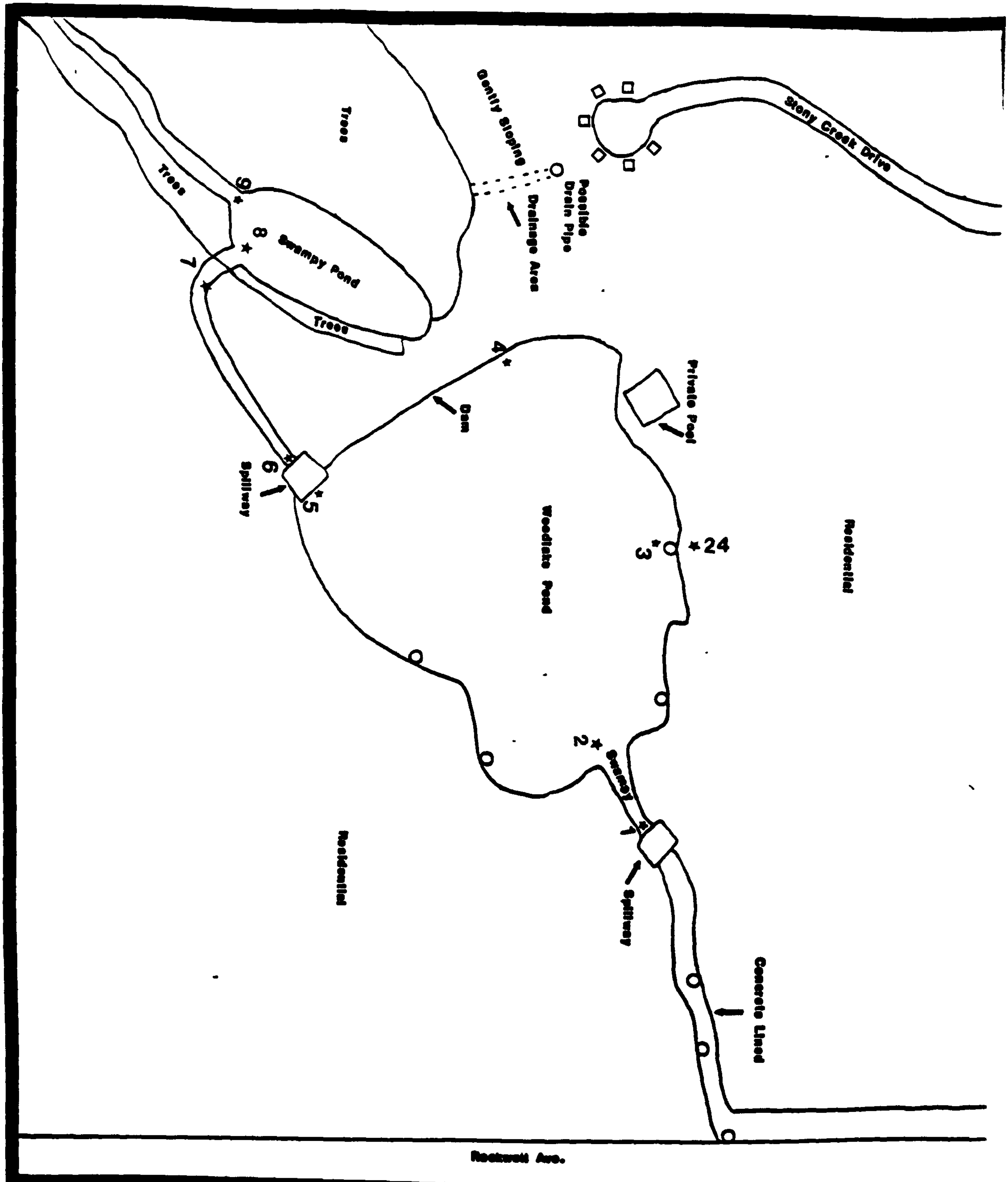


Site Sketch
Air Center Inc.
Oklahoma City, Oklahoma
OKD980750319
TDD# F-6-8707-11
Sit In p ction: 7-23-87

Figure 1

O Spots of Dead Vegetation
:::: Fence Line
2 * Possible Sampling Points

N



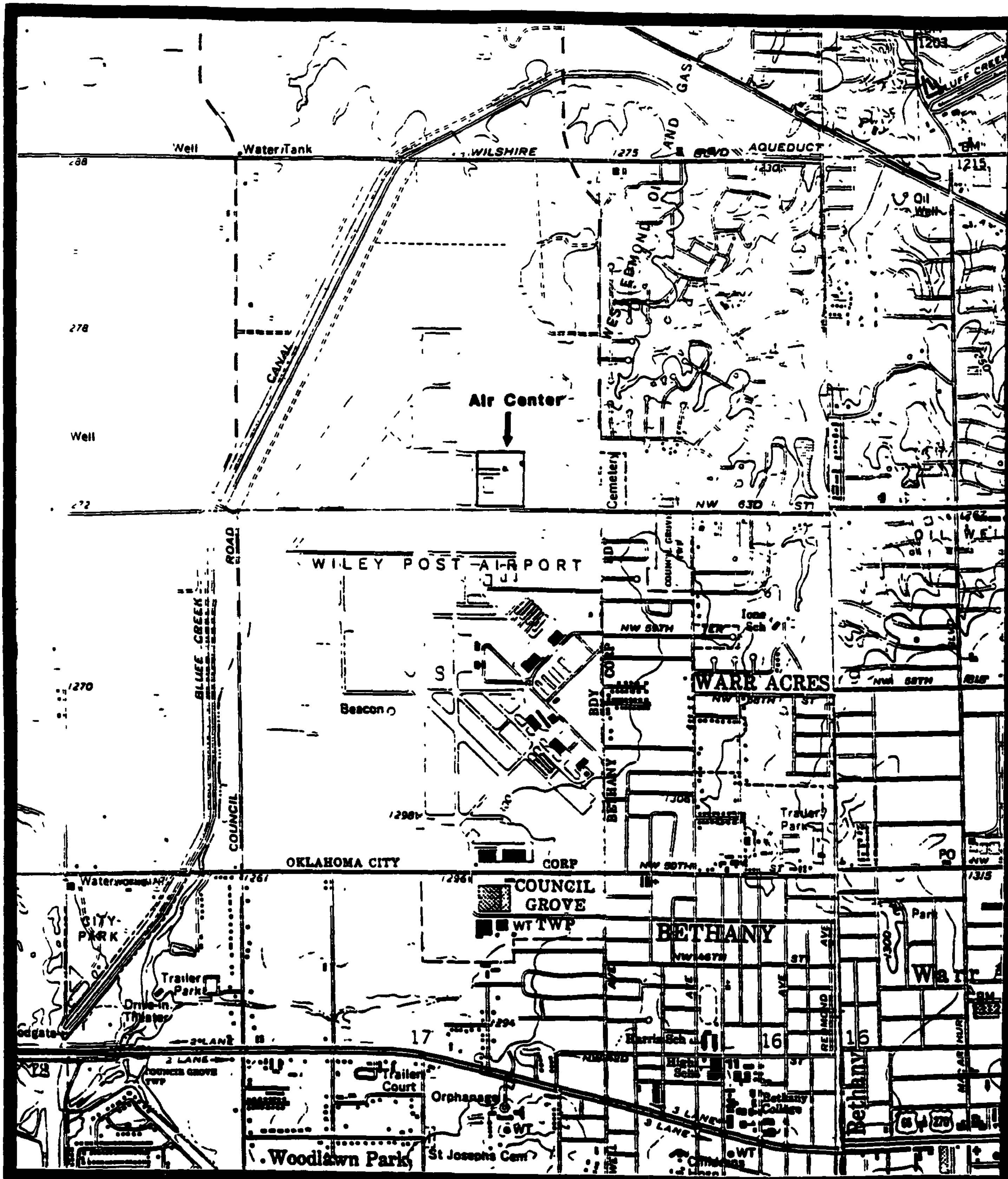
Water Course for Drainage Ditch after leaving Air Center
OKD980750319
TDD# F-6-8707-11

Figure 2

○ **Drainage inlets fr Surrounding Streets**

* **Proposed S pling Points**

Not To S



OKLAHOMA

QUADRANGLE LOCATION

U.S.G.S. 7.5 min.

TOPOQUADRANGLES

TITLE : SITE LOCATION

SITE NAME : Air Center

Oklahoma City, Oklahoma

CERCLIS NO. : OKD980750319

TDD NO. : F-6-8707-11

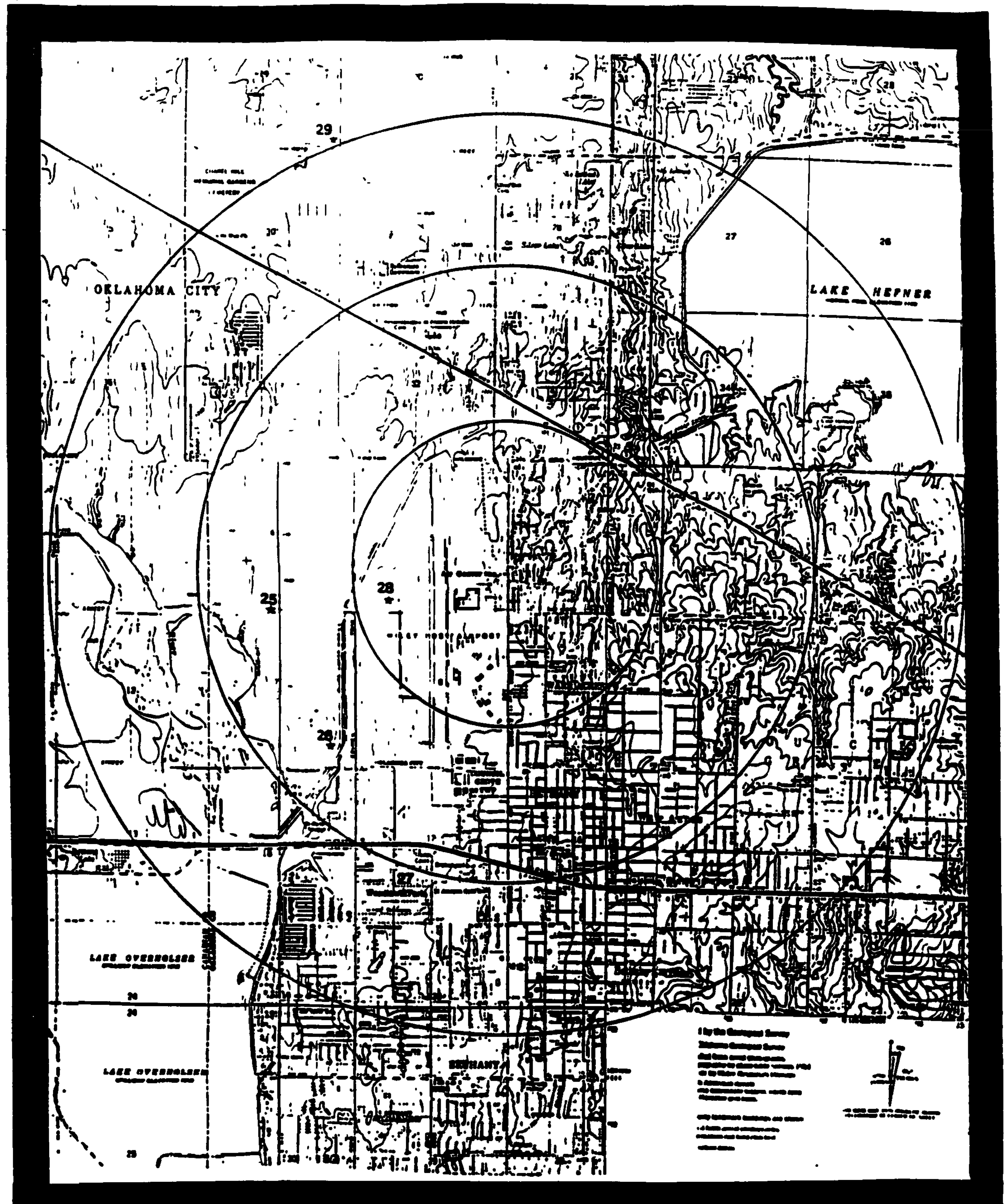
N

Figure 3

1 MILE 0

CONTOUR INTERVAL 10 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929



★ WELL LOCATIONS

DRINKING WATER WELL LOCATIONS

Air Center Inc.

Okl homa City, Okl hom

OKD 07 D31

Figure 4

N

Locations sampled in january 1988

Off-site Woodlake Pond Samples

Sample No.	Map Location No.	Location
1	1a	Sediment, northeastern end of spillway leading into Woodlake Pond from Air Center.
2	1b	Water, northeastern end of spillway leading into Woodlake Pond from Air Center. QAQC, extra volume.
3	2	Sediment, mouth of drainage ditch leading from Air Center as it enters Woodlake Pond.
4	3	Sediment, SE end of pond close to drainage inlet.
5	4	Sediment, NE edge of pond.
6	4	Duplicate, sediment, NE edge of pond.
7	5	Sediment, SW side of spillway leading from Woodlake Pond. QAQC.
8	6	Sediment, NE side of spillway leading from Woodlake Pond.
9	7	Sediment, along curvature in drainage ditch as it leaves Woodlake Pond.
10	8	Sediment, mouth of drainage ditch as it enters the swampy area.
11	9	Sediment, mouth of drainage ditch as it leaves the swampy area.
12	24	1 foot deep soil on bank just south of sample # 4.

Locations sampled in january 1988

On-Site Samples

Sample No.	Map Location No.	Location
13	10	Soil, (sediment) 1 ft. depth, NE corner of site, where pond leaves site through drainage ditch.
14	10	Water, NE corner of site, where pond leaves site through drainage ditch.
15	11	Soil, (sediment) 1 ft. depth, NE side of overflow valve in lower pond.
16	12	Soil, (sediment) 1 ft. depth, SW side of overflow valve in upper pond.
17	13	Soil, (sediment) 1 ft. depth, inlet into the upper pond (swampy area).
18	14	Soil, 1 ft. depth, SE slope of lagoon into drainage ditch.
19	15	Soil, 1 ft. depth, on south east side of drainage ditch near dead tree.
20	16	Soil, 1 ft. depth, depression along the southeast edge of lagoon. (possible breech in birm)
21	17	Soil, 1 ft. depth, SW corner of lagoon.
22	17	Soil, 6 ft. depth, SW corner of lagoon. QAQC.
23	18	Soil, 1 ft. depth, south central circular patch of dead vegetation.
24	18	Soil, 6 ft. depth, south central circular patch of dead vegetation.
25	18	Duplicate, soil, 6 ft. depth, south central circular patch of dead vegetation.
26	19	Soil, 1 ft depth, NW corner of lagoon.
27	19	Soil, 6 ft, depth, NW corner of lagoon.
28	20	Soil, 1 ft. depth, in drainage ditch as concrete pipe enters ditch.

Locations sampled in january 1988

On-Site Sampling (con't)

Sample No.	Map Location No.	Location
29	20	Duplicate, soil, 1 ft. depth, in drainage ditch as concrete pipe enters ditch.
30	21	Soil, 1 ft. depth, circular patch of dead vegetation to the east of the southeast hanger.
31	22	Water, underground storage tank.
32	22	Duplicate, water, underground storage tank.
33	23	Soil, 1 ft. depth, north of paint stripping hanger on the north side of the dirt road.
34	23	Soil, 6 ft. depth, north of paint stripping hanger on the north side of the dirt road.

Locations sampled in january 1988

Residential Well Sampling

Sample No.	Map Location No.	Location
[redacted]		DW, [redacted]
36	26	DW, City of Bethany, Well # 21, QAQC, extra volume.
[redacted]		DW, [redacted]
38	28	DW, City of Bethany, Well # 23
39	28	Duplicate, DW, City of Bethany, Well # 23.
[redacted]		DW, [redacted]
41	-	Field Blank

TABLE I

MAJOR COMPOUNDS DETECTED (ppb) (FOR COMPLETE LIST REFER TO ORGANIC ANALYSIS SUMMARY)

ON - SITE MAP LOCATION #	DESCRIPTION	Phenol	Xylene	2 Methyl Naphthalene	Bis(2-Ethyl Hexyl Pthalate)	Benzyl Butyl Phthalate
23	Background soil 1' soil 6'	---	---	---	---	---
22	Underground storage tank (water)	46J	41J	35J	---	---
22	Underground storage tank (water-dup)	62J	47J	42J	---	---
21	Soil	---	---	---	---	---
17	Soil 1'	---	---	---	---	---
17	Soil 6'	---	---	---	---	---
18	Soil 1'	---	---	---	---	---
18	Soil 6'	---	---	---	---	---
18	Soil 6' (dup)	---	---	---	---	---
19	Soil 1'	---	---	---	---	---
19	Soil 6'	---	---	---	---	---
14	Soil 1'	---	---	---	---	---
20	Soil 1'	2700J	---	---	150J	110J
20	Soil 1'	3500J	---	---	220J	---
16	Soil 1'	---	---	---	---	---
15	Soil 1'	---	---	---	---	---
13	Soil	10000J	---	---	---	---
12	Soil	---	---	---	---	---
11	Soil	---	---	---	---	---
10	Soil	---	---	---	---	---

OFF - SITE

TABLE II

MAP LOCATION #	DESCRIPTION	MAJOR COMPOUNDS DETECTED (ppb) (FOR COMPLETE LIST REFER TO ORGANIC ANALYSIS SUMMARY) Benzene	2 cyclohexene-1-one	4-methyl-4-Pentene-2-One	4,8,12-Trimethyl 3-7 11 Tridecatrienenitrile	Molecular Sulfur	1,2 Benzenediol	Fluoranthene	2 Hydroxy benzoic acid	Benzo Anthracene
24	Soil 1'				430J	340J	830J		1300J	
1a	Water 1'		16J	18J						
2	Soil 1'				490J					
3	Soil 1'					1000J				
4	Soil 1'	9J				200J		2200J		570J
	dup	8J			300J	270J				
5	Soil 1'				590J					
6	Soil 1'	8J								
7	Soil 1'	9J			430J					
8	Soil 1'	11J			680J	460J				
9	Soil 1'					2100J				

OFF-SITE

TABLE IIA

MAP LOCATION #	DESCRIPTION	MAJOR COMPOUNDS DETECTED (ppb) (Continued)					
		Chrysene	Pyrene	Hexane	1,2,3,4 Tetrahdro 1,6,-Dimethyl -4(1-Methylethyl) Napthalene	Phenol	2 Hydroxy Cyclo hexane
24	Soil 1'					1200J	1200
4	Soil 1' (dup)	770J	1700J				
5	Soil 1'			6J			
7					360J		

ON - SITE

TABLE III

Soil - ppm;

MAP LOCATION	DESCRIPTION		MAJOR CLASSES OF (FOR COMPLETE LIST REFER TO INORGANIC ANALYSIS SUMMARY) Water - ppb							
			Arsenic	Cadmium	Chromium	Lead	Nickel	Vanadium	Zinc	Cyanide
23	Background Soil	1'	7J	---	9.8J	9.9	11.6	4.2	22.8	---
		6'	16.5J	---	18.3J	6.9	27.3	25.7J	35	---
22	Underground (water)		5				31		18	12
	Storage Tank (water dup)		5	---	---	---		---	25	11
21	Soil	1'	8.4J	---	---	---	---	18.2	24.9	---
17	Soil	1'	9.1J	---	---	---	---	20	21	---
		6'	8.1J	---	---	---	---	22.7	23.8	---
18	Soil	1'	---	---	---	---	---	18.5	21.1	---
		6'					5.1J	20.8	19	---
	(dup)	6'						22.1		
19	Soil	1'	9.8J	---	---	---	---	28.7	28.9	---
		6'	---	---	---	---	---	25.8	---	---
14	Soil	1'	7.80	---	---	---	7.2J	20.6	22.3	---
20	Soil	1'	3.4J	---	---	---	14.6J	20.3	59.1	4.7
	(dup)	1'	5.4J	---	---	---	17.2J	22.3	---	3
16	Soil	1'	10.4J	---	---	---	---	20	24.4	---
15	Soil	1'	12J	1.2J	---	---	15.3J	22.3	31.9	5
13	Soil	1'	12J	4.4J	---	---	---	26.8	75.3	78.2
12	Soil	1'	7.4J	---	---	---	---	19.6	33.7	---
11	Soil	1'	8.8J	---	---	---	---	16.7	39.5	---
10	Water		---	---	27	---	---	---	27	---

12

OFF-SITE

TABLE IV

Soil - ppm;

MAP LOCATION	DESCRIPTION	MAJOR CLASSES OF (FOR COMPLETE LIST REFER TO INORGANIC ANALYSIS SUMMARY) Water - ppb						
		Arsenic	Chromium	Lead	Nickel	Vanadium	Zinc	Cyanide
24	Background soil	7J	28J	22	31.9	29.6J	55.8	---
1	Soil 1'	3.5J	15.3J	33.1	13.9	16J	32	---
1	Water 1'	---	---	4.2	---	10.7	51.7	---
2	Soil 1'	5.10J	16.7J	8.5	14.5	21.1J	27.8	---
3	Soil 1'	9.3J	26.4J	6.8	30.4	32.7J	51.5	---
4	Soil 1'	6.4J	32.3J	7.8	39.5	26.7J	66.3	---
	(dup)	5.3J	41.1J	9.9	39.4	42J	72.5	---
5	Soil 1'	9.4J	20.6J	12.3	20	27.6	32	---
6	Soil 1'	9J	12.9	6.5	12.9	16.4J	26.8	---
7	Soil 1'	11.9J	32.7J	18.3	31.2	34.5J	62.3	---
8	Soil 1'	10.2J	17.8J	13.6	17.6	30.9J	41.4	---
9	Soil 1'	11J	23.4J	25.6	25.6	27.6J	47.2	---

TABLE V

Drinking Water Wells

Map Location	Bis (2-Ethyl Hexyl) Phthalate	Cadmium	Vanadium	Arsenic	Zinc	Chromium	Lead
25					49ppb		
26		—	48ppb	17ppb	43 ppb	15ppb	176ppb
27		—	—	—	133 ppb	—	—
28	9ppb	—	—	4ppb	73 ppb	—	—
dup	28ppb	19ppb		—	—	—	66ppb
29 background		—		6ppb	120 ppb	—	—

TABLE VI

pH and Conductivity Measurements

Map Location	pH	Conductivity	Temperature
22 (underground storage tank)	11.94	1100 umhos	18°C
10	7.66	250 umhos	14°C
1	7.60	270 umhos	16°C
25	7.34	910 umhos	11°C
26	7.06	1100 umhos	10°C
27	7.00	725 umhos	12.5°C
28	7.30	500 umhos	12°C
29	7.20	1650 umhos	11.5°C

DATA QUALITY ASSURANCE REVIEW

SITE NAME Air Center, Inc. Oklahoma City, OK

SITE CODE OKD980750319

PAN FOK0270SBF

CASE NUMBER 8811

LABORATORY SPECTRIX

SAMPLE NUMBERS

MFF 427	MFF 431	MFF 435	MFF 503
MFF 428	MFF 432	MFF 456	MFF 794
MFF 429	MFF 433	MFF 457	MFF 795
MFF 430	MFF 434	MFF 458	

REVIEWER Victor Cason, ICF Technology

DATA EVALUATION

SITE NAME Air Center Inc. CASE NO. 8811 PAGE 1

This package contains thirteen soil and two water samples analyzed for total metals and cyanide in low concentrations. The following qualifications are placed on the data.

1) The recovery value for chromium (Cr) was out of control limits in the soil Laboratory Control Sample. Since the analysis was not terminated and the problem fixed, all results for Cr are considered estimates (J flag).

2) Antimony (Sb) soil matrix spike recovery was unacceptable, therefore, the values for Sb in samples MFF 427 - 435, MFF 546, MFF 457, MFE 794 and MFE 503 are unusable (R flag).

3) The recovery values for iron (Fe), aluminum (Al) and manganese (Mn) were unacceptable in the water matrix spike. Therefore, all values for these metals in samples MFF 458 and MFE 795 are unusable (R flag).

4) Recovery values for arsenic (As) and manganese (Mn) were low in the soil matrix spike. Actual sample concentrations and detection limits for these elements may be as great as 2.3 and 1.7 times the reported numbers, respectively. Values reported for samples MFF 427 - 435, MFF 546, MFF 457, MFE 794 and MFE 503 are considered estimates (J flag).

DATA EVALUATION

SITE NAME Air Center Inc. CASE NO. 8811 PAGE 2

5) The soil duplicate recoveries were out of control limits for barium, chromium, vanadium and iron. Therefore, the values for these elements in samples MFF 427 - 435, MFF 546, MFF 457, MFE 794 and MFE 503 are considered as estimates (J flag).

7) The water duplicate recoveries were out of control limits for elements aluminum, calcium, iron, manganese, and sodium. Therefore the values for these elements in samples MFF 458 and MFE 795 are considered as estimates (J flag).

8) The method of standard addition correlation coefficients for As in samples MFF 430 and MFF 432 did not meet the control limit requirements. The values for As in the two samples are considered as estimates (J flag).

9) All other QA/QC requirements were within control limits.

INORGANIC CHECKLIST

1. Was the method of standard addition performed on any analysis?____.
   If yes, complete the table below:

ELEMENT	SAMPLE #	CORRELATION COEFFICIENT	
Hg	MFF 4360	.9993	
Hg	438	.99[illegible]	
[illegible]	438	.9999	
[illegible]	440	.9973	
Hg	441	.9814	
[illegible]	441	.9812	-
[illegible]	445	.9999	
[illegible]	446	[illegible]	
[illegible]	4[illegible]	[illegible]	+
[illegible]	447	.99[illegible]	
[illegible]	451	.9778	
[illegible]	451	.982[illegible]	+
Hg	452	.9985	
Hg	454	.9991	
Pb	436	.9962	
Pb	4360	.9984	
Pb	438	.9980	

Were all the correlation coefficients greater than .995? N.

NOTE: IF MSA IS PERFORMED AND THE CORRELATION COEFFICIENT IS LESS THAN .995, THE ANALYSIS MUST BE REPEATED ONCE. IF IT IS STILL LESS THAN .995, FLAG THE RESULTS WITH "+".

Pb	439	.9999
Pb	440	.9992
Pb	441	.9992
Pb	442	.9990
Pb	443	.9990
Pb	444	.9967
Pb	445	.9950
Pb	446	.9968
Pb	450	.9970
Pb	451	.9986
Pb	453	.9997
Se	4365	.9934
Se	4365	.9980
Se	4375	.9967
Se	445	.9968

INORGANIC ANALYSIS SUMMARY FOR SOIL

SITE NAME AND NUMBER: AIR CENTER, INC
CASE NUMBER: 8811 PAGE 1 OF 2
CONCENTRATIONS IN PARTS PER MILLION (PPM)

TRAFFIC REPORT NUMBER AND STATION LOCATION.

		MFE 503	MFE 794	MFF 427	MFF 428	MFF 429	MFF 430	MFF 431	MFF 432	MFF 433	MFF 434	MFF 435	MFF 456
		3	1	4	5	6	7	8	9	10	11	12	33
		STA 3	STA 1	STA 4	STA 5	STA 6	STA 7	STA 8	STA 9	STA 10	STA 11	STA 12	STA 33
		SAMPLE LOCATION 3	SAMPLE LOCATION 1	SAMPLE LOCATION 4	SAMPLE LOCATION 5	SAMPLE LOCATION 6	SAMPLE LOCATION 7	SAMPLE LOCATION 8	SAMPLE LOCATION 9	SAMPLE LOCATION 10	SAMPLE LOCATION 11	SAMPLE LOCATION 12	SAMPLE LOCATION 33
	MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	WATER	SOIL
	% MOISTURE	23	18	21	26	20	23	20	25	41	42	20	13
	CAS NO.												
ALUMINUM	7429-90-5	10100	7480	12300	19300	22800	12600	8610	20600	8960	10500	18500	8990
ANTIMONY	7440-36-0	0R	0R	0R	0R	0R	0R	0R	0R	0R	0R	0R	0R
ARSENIC	7440-38-2	5.100J	3.900J	9.300J	6.400J	5.300J	9.400J	9J	11.900J	10.200J	11J	7J	7J
BARIUM	7440-39-3	127J	72J	86J	118J	116J	150J	84.900J	162J	404J	187J	151J	96.400J
BERYLLIUM	7440-41-7	0.880	0.630	1.400	1.500	2	1.900	1.400	1.400	1.200	0.900	1.100	1.200
CADMIUM	7440-43-9	1U	0.970U	1	1.100U	1U	1U	1U	1.100U	1.400U	1.400U	1U	0.920U
CALCIUM	7440-70-2	2820	14400	74000	21100	17000	3370	1820	4900	11300	14100	12600	2040
CHROMIUM	7440-47-3	16.700J	15.300J	23.400J	32.300J	41.100J	20.600J	12.900J	32.700J	17.800J	23.400J	28J	9.800J
COBALT	7440-48-4	6.600	6.400	11	14.900	16.500	8.800	5.200	13.800	8.800	11	13.200	6.600
COPPER	7440-50-8	5.200	5.600	10.300	12.800	13.700	8.200	5.500	13.700	11.700	11.800	12.600	8.100
IRON	7439-89-6	14400J	11600J	21900J	26900J	33800J	18200J	10900J	30500J	14700J	18300J	24900J	9660J
LEAD	7439-92-1	8.500	33.100	6.800	7.800	9.900	12.300	6.500	18.300	13.600	25.600	22	9.900
MAGNESIUM	7439-95-4	3490	5070	12200J	20900	16600	3440	1880	8810	6220	8710	9970	1550
MANGANESE	7439-96-5	237J	199J	475J	997J	610J	308J	165J	4499J	384J	469J	580J	233J
MERCURY	7439-97-6	0.130U	0.120U	0.130U	0.140U	0.120U	0.130U	0.120U	0.130U	0.170U	0.170U	0.120U	0.120U
NICKEL	7440-02-0	14.500	13.900	30.400	39.500	39.400	20	12.900	31.200	17.600	25.600	31.900	11.600
POTASSIUM	7440-09-7	1640	1530	1860	3140	4560	1750	988	4040	1410	1410	3750	1120
SELENIUM	7782-49-2	1U	1U	1U	1.100U	1U	1U	1U	1.100U	1.400U	1.400U	1U	0.900U
SILVER	7440-22-4	0.910U	0.850U	0.830U	0.950U	0.880U	0.920U	0.880U	0.930U	1.200U	1.200U	0.880U	0.810U
SODIUM	7440-23-5	145	302	490	332	400	75.800	70.200U	277	468	397	328	64.700U
THALLIUM	7440-28-0	1.300U	1.200U	1.300U	1.400U	1.300U	1.300U	1.300U	1.300U	1.700U	1.700U	1.300U	1.200U
TIN	7440-31-5	0	0	0	0	0	0	0	0	0	0	0	0
VANADIUM	7440-62-2	21.100J	16J	32.700J	26.700J	42J	27.600J	16.400J	34.500J	30.900J	27.600J	29.600J	4.200J
ZINC	7440-66-6	27.800	32	51.500	66.300	75.500	32	26.800	62.300	41.400	47.200	55.800	22.800
CYANIDE		0.650U	0.610U	0.640U	0.680U	0.630U	0.650U	0.630U	0.670U	0.860U	0.860U	0.630U	0.580U
HARDNESS		0	0	0	0	0	0	0	0	0	0	0	0
ALKALINITY		0	0	0	0	0	0	0	0	0	0	0	0

R - DATA IS UNUSABLE DUE TO QA/QC OUT OF CONTROL LIMITS.
J - REPORTED CONCENTRATIONS OR DETECTION LIMITS ARE ESTIMATES DUE TO QA/QC OUT OF CONTROL LIMITS.
B - CONCENTRATION IN SAMPLE ATTRIBUTABLE TO BLANK CONTAMINATION.
U - NOT DETECTED; VALUE REPORTED IS THE DETECTION LIMIT.

INORGANIC ANALYSIS SUMMARY FOR SOIL

SITE NAME AND NUMBER: AIR CENTER, INC
CASE NUMBER: 8811 PAGE 2 OF 2
CONCENTRATIONS IN PARTS PER MILLION (PPM)

TRAFFIC REPORT NUMBER AND STATION LOCATION.

		MFF 457 34 STA 34 SAMPLE LOCATION 34											
	MATRIX	SOIL											
	% MOISTURE	12	0	0	0	0	0	0	0	0	0	0	0
	CAS NO.												
ALUMINUM	7429-90-5	12200	0	0	0	0	0	0	0	0	0	0	0
ANTIMONY	7440-36-0	0R	0	0	0	0	0	0	0	0	0	0	0
ARSENIC	7440-38-2	10.500J	0	0	0	0	0	0	0	0	0	0	0
BARIUM	7440-39-3	151J	0	0	0	0	0	0	0	0	0	0	0
BERYLLIUM	7440-41-7	1.600	0	0	0	0	0	0	0	0	0	0	0
CADMIUM	7440-43-9	0.910U	0	0	0	0	0	0	0	0	0	0	0
CALCIUM	7440-70-2	2400	0	0	0	0	0	0	0	0	0	0	0
CHROMIUM	7440-47-3	18.300J	0	0	0	0	0	0	0	0	0	0	0
COBALT	7440-48-4	14.400	0	0	0	0	0	0	0	0	0	0	0
COPPER	7440-50-8	11	0	0	0	0	0	0	0	0	0	0	0
IRON	7439-89-6	15400J	0	0	0	0	0	0	0	0	0	0	0
LEAD	7439-92-1	6.900	0	0	0	0	0	0	0	0	0	0	0
MAGNESIUM	7439-95-4	3310	0	0	0	0	0	0	0	0	0	0	0
MANGANESE	7439-96-5	340J	0	0	0	0	0	0	0	0	0	0	0
MERCURY	7439-97-6	0.110U	0	0	0	0	0	0	0	0	0	0	0
NICKEL	7440-02-0	27.300	0	0	0	0	0	0	0	0	0	0	0
POTASSIUM	7440-09-7	1370	0	0	0	0	0	0	0	0	0	0	0
SELENIUM	7782-49-2	0.900U	0	0	0	0	0	0	0	0	0	0	0
SILVER	7440-22-4	0.800U	0	0	0	0	0	0	0	0	0	0	0
SODIUM	7440-23-5	66.200	0	0	0	0	0	0	0	0	0	0	0
THALLIUM	7440-28-0	1.100J	0	0	0	0	0	0	0	0	0	0	0
TIN	7440-31-5	0	0	0	0	0	0	0	0	0	0	0	0
VANADIUM	7440-62-2	25.700J	0	0	0	0	0	0	0	0	0	0	0
ZINC	7440-66-6	35	0	0	0	0	0	0	0	0	0	0	0
CYANIDE		0.570U	0	0	0	0	0	0	0	0	0	0	0
HARDNESS		0	0	0	0	0	0	0	0	0	0	0	0
ALKALINITY		0	0	0	0	0	0	0	0	0	0	0	0

R - DATA IS UNUSABLE DUE TO QA/QC OUT OF CONTROL LIMITS.
J - REPORTED CONCENTRATIONS OR DETECTION LIMITS ARE ESTIMATES DUE TO QA/QC OUT OF CONTROL LIMITS.
B - CONCENTRATION IN SAMPLE ATTRIBUTABLE TO BLANK CONTAMINATION.
U - NOT DETECTED; VALUE REPORTED IS THE DETECTION LIMIT.

INORGANIC ANALYSIS SUMMARY FOR WATER

SITE NAME AND NUMBER: AIR CENTER, INC
CASE NUMBER: 8311 PAGE 1 OF 1
CONCENTRATIONS IN PARTS PER BILLION (PPB)

TRAFFIC REPORT NUMBER AND STATION LOCATION.

		DRINKING WATER CRITERIA P - PRIMARY S - SECONDARY	MFF 437 14 STA 14 SAMPLE LOCATION 14	MFF 452 31 STA 31 SAMPLE LOCATION 31	MFF 454 32 STA 32 SAMPLE LOCATION 32		
	MATRIX		WATER	WATER	WATER		
	% MOISTURE		100	100	100	0	0
	CAS NO.						
ALUMINUM	7429-90-5		8140	427	387	0	0
ANTIMONY	7440-36-0		54U	54U	54U	0	0
ARSENIC	7440-38-2	50P	5U	5	5	0	0
BARIUM	7440-39-3	1000P	180	247	262	0	0
BERYLLIUM	7440-41-7		2U	2U	2U	0	0
CADMIUM	7440-43-9	10P	5U	5U	5U	0	0
CALCIUM	7440-70-2		42400	128000	129000	0	0
CHROMIUM	7440-47-3	50P	27	8U	8U	0	0
COBALT	7440-48-4		20U	20U	20U	0	0
COPPER	7440-50-8	1000S	16U	16U	16U	0	0
IRON	7439-89-6	300S	10100	550	830	0	0
LEAD	7439-92-1	50P	4U	4U	4U	0	0
MAGNESIUM	7439-95-4		16300	390U	390U	0	0
MANGANESE	7439-96-5	50S	1050	9U	9U	0	0
MERCURY	7439-97-6	2P	0.200U	0.200U	0.200U	0	0
NICKEL	7440-02-0		21U	31	21U	0	0
POTASSIUM	7440-09-7		5190	15000	15200	0	0
SELENIUM	7782-49-2	10P	4UJ	4UJ	4UJ	0	0
SILVER	7440-22-4	50P	9UJ	9UJ	9UJ	0	0
SODIUM	7440-23-5		12900	74300	75800	0	0
THALLIUM	7440-28-0		5U	5U	5U	0	0
TIN	7440-31-5		0	0	0	0	0
VANADIUM	7440-62-2		16U	16U	16U	0	0
ZINC	7440-66-6	5000S	27	18	25	0	0
CYANIDE			10U	12	11	0	0
HARDNESS			0	0	0	0	0
ALKALINITY			0	0	0	0	0

R - DATA IS UNUSABLE DUE TO QA/QC OUT OF CONTROL LIMITS.
J - REPORTED CONCENTRATIONS OR DETECTION LIMITS ARE ESTIMATES DUE TO QA/QC OUT OF CONTROL LIMITS.
B - CONCENTRATION IN SAMPLE ATTRIBUTABLE TO BLANK CONTAMINATION.
U - NOT DETECTED; VALUE REPORTED IS THE DETECTION LIMIT.

INORGANIC ANALYSIS SUMMARY FOR WATER

SITE NAME AND NUMBER: AIR CENTER, INC
CASE NUMBER: 8811 PAGE 1 OF 1
CONCENTRATIONS IN PARTS PER BILLION (PPB)

TRAFFIC REPORT NUMBER AND STATION LOCATION.

		DRINKING WATER CRITERIA P - PRIMARY S - SECONDARY	MFE 735 2 STA 2 SAMPLE LOCATION 2	MFE 458 41 STA 41 SAMPLE LOCATION 41			
	MATRIX		WATER	WATER			
	% MOISTURE		100	100	0	0	0
	CAS NO.						
ALUMINUM	7429-90-5		OR	OR	0	0	0
ANTIMONY	7440-36-0		23.800U	23.800U	0	0	0
ARSENIC	7440-38-2	50P	5U	5U	0	0	0
BARIUM	7440-39-3	1000P	262	11.900U	0	0	0
BERYLLIUM	7440-41-7		1.700	1.700	0	0	0
CADMIUM	7440-43-9	10P	4U	4U	0	0	0
CALCIUM	7440-70-2		84700J	116J	0	0	0
CHROMIUM	7440-47-3	50P	6.400U	6.400U	0	0	0
COBALT	7440-48-4		11.600U	11.600U	0	0	0
COPPER	7440-50-8	1000S	17.200U	17.200U	0	0	0
IRON	7439-89-6	300S	OR	OR	0	0	0
LEAD	7439-92-1	50P	4.200	4U	0	0	0
MAGNESIUM	7439-95-4		30500J	92UJ	0	0	0
MANGANESE	7439-96-5	50S	OR	OR	0	0	0
MERCURY	7439-97-6	2P	0.200U	0.200U	0	0	0
NICKEL	7440-02-0		18.500U	18.500U	0	0	0
POTASSIUM	7440-09-7		6240	1020U	0	0	0
SELENIUM	7782-49-2	10P	4U	4U	0	0	0
SILVER	7440-22-4	50P	3.500U	3.500U	0	0	0
SODIUM	7440-23-5		73400J	280UJ	0	0	0
THALLIUM	7440-28-0		5U	5U	0	0	0
TIN	7440-31-5		0	0	0	0	0
VANADIUM	7440-62-2		10.700	6.800U	0	0	0
ZINC	7440-66-6	5000S	51.700	18.600	0	0	0
CYANIDE			10U	10U	0	0	0
HARDNESS			0	0	0	0	0
ALKALINITY			0	0	0	0	0

R - DATA IS UNUSABLE DUE TO QA/QC OUT OF CONTROL LIMITS.
J - REPORTED CONCENTRATIONS OR DETECTION LIMITS ARE ESTIMATES DUE TO QA/QC OUT OF CONTROL LIMITS.
B - CONCENTRATION IN SAMPLE ATTRIBUTABLE TO BLANK CONTAMINATION.
U - NOT DETECTED; VALUE REPORTED IS THE DETECTION LIMIT.

8811B - 2016
8811 D - 1016

DATA QUALITY ASSURANCE REVIEW

SITE NAME Air Center, Inc. Oklahoma City, OK

SITE CODE OKD980750319

PAN IOK0270SBF

CASE NUMBER 8811

LABORATORY SPECTRIX

SAMPLE NUMBERS

MFF 436	MFF 441	MFF 446	MFF 451
MFF 437	MFF 442	MFF 447	MFF 452
MFF 438	MFF 443	MFF 448	MFF 453
MFF 439	MFF 444	MFF 449	MFF 454
MFF 440	MFF 445	MFF 450	MFF 455

REVIEWER Victor Cason, ICF Technology

DATA EVALUATION

SITE NAME Air Center, INC. CASE NO. 8811

The package consists of seventeen soil and three water samples analyzed for total metals and cyanide at low concentration. The following qualifications are placed on the data.

1) Cadmium was out of the control limits for the soil Laboratory Control Sample. The analysis was not terminated. Therefore, the reported values for Cd are considered estimates (J flag) for samples MFF 436, 438-451, 453, and 455.

2) Matrix spike recoveries of antimony, chromium, lead, selenium and silver were unacceptable in the soil matrix spike. All of the values reported for these elements in the soil samples listed above are unusable (R flag).

3) The value for Ni in the soil matrix spike was low. Therefore, the reported values and detection limits for all soil samples could be as great as 2.5 times the Ni concentrations and should be considered estimates (J flag).

4) The recovery value for As in the soil matrix spike was low. The reported values may 1.8 times larger. Reported arsenic values and detection limits should be considered as estimates, (J flag) for all soil samples.

DATA EVALUATION

SITE NAME Air Center, Inc. CASE NO. 8811

5) The recovery value for selenium was high for the water matrix spike. The actual sample values for the element could be as low as 0.75 times that reported. Reported values for the elements are considered estimates (J flag) for all water samples.

6) The recovery for Ag in the water matrix spike was low. Therefore, the water sample silver values and detection limits are considered estimates (J flag) and may be as much as 1.4 times the reported values.

7) Soil duplicate results were out of control limits for chromium and arsenic. Reported concentrations of these metals are considered estimates (J flag).

8) All other QA/QC requirements were within control limits.

INORGANIC ANALYSIS SUMMARY FOR SOIL

SITE NAME AND NUMBER: AIR CENTER, INC
CASE NUMBER: 8811 PAGE 1 OF 2
CONCENTRATIONS IN PARTS PER MILLION (PPM)

TRAFFIC REPORT NUMBER AND STATION LOCATION.

		MFF 436	MFF 438	MFF 439	MFF 440	MFF 441	MFF 442	MFF 443	MFF 444	MFF 445	MFF 446	MFF 447	MFF 448
		12	15	17	18	19	20	21	22	23	24	25	26
		STA 13	STA 15	STA 17	STA 18	STA 19	STA 20	STA 21	STA 22	STA 23	STA 24	STA 25	STA 26
		SAMPLE LOCATION 13	SAMPLE LOCATION 15	SAMPLE LOCATION 17	SAMPLE 18	SAMPLE LOCATION 19	SAMPLE LOCATION 20	SAMPLE LOCATION 21	SAMPLE LOCATION 22	SAMPLE LOCATION 23	SAMPLE LOCATION 24	SAMPLE LOCATION 25	SAMPLE LOCATION 26
	MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	% MOISTURE	32	33	23	17	20	18	16	8	17	14	14	17
	CAS NO.												
ALUMINUM	7429-90-5	25000	12000	15600	13000	13700	10800	11200	9380	9520	5830	14800	23800
ANTIMONY	7440-36-0	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR
ARSENIC	7440-38-2	12.800J	8.800J	12J	7.800J	12J	10.400J	9.100J	8.100J	4.700J	6.300J	1.200J	9.200J
BARIUM	7440-39-3	194	133	130	118	134	148	130	99.100	120	116	117	145
BERYLLIUM	7440-41-7	0.890	0.600U	0.520	0.400U	0.500U	0.490U	0.480U	0.660	0.480U	0.460U	0.460U	0.960
CADMIUM	7440-43-9	1.500UJ	1.500UJ	4.400J	1.200UJ	1.200J	1.200UJ	1.200UJ	1.100UJ	1.200UJ	1.200UJ	1.200UJ	1.200UJ
CALCIUM	7440-70-2	6160	2020	3380	2740	2150	2670	2260	2300	2470	2330	2300	2970
CHROMIUM	7440-47-3	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR
COBALT	7440-48-4	17.100	6U	8.300	9.100	8.800	11	7.900	9.400	0	7.600	9.500	5.[illegible]
COPPER	7440-50-8	22.200	9.600	11.700	6.700	7.500	5.800	7.600	7.400	7	6.500	6.300	10.800
IRON	7439-89-6	33800	11300	15700	13700	14200	12900	13600	12600	10300	11800	13100	15200
LEAD	7439-92-1	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR
MAGNESIUM	7439-95-4	11900	27700	2220	2120	1970	2040	1850	1700	1480	1530	1850	[illegible]
MANGANESE	7439-96-5	618	357	203	213	230	576	226	312	196	214	193	172
MERCURY	7439-97-6	0.150U	0.150U	0.130U	0.120U	0.130U	0.120U	0.120U	0.110U	0.120U	0.120U	0.120U	0.1[illegible]
NICKEL	7440-02-0	6.200UJ	6.300UJ	5.400UJ	7.200J	15.300J	5.100UJ	5UJ	4.600UJ	5UJ	5.100J	4.900UJ	5.100UJ
POTASSIUM	1440-09-7	6180	2250	1780	1370	1800	1380	1230U	1200	1220	772	1260	1680
SELENIUM	7782-49-2	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR
SILVER	7440-22-4	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR
SODIUM	7440-23-5	345	83.700U	72.700U	67.200U	70.300U	68.300U	66.700U	116	67.200U	64.900U	67.400	56.400
THALLIUM	7440-28-0	1.500U	1.500U	1.300U	1.200U	1.300U	1.200U	1.200U	1.100U	1.200U	1.200U	1.100U	1.200U
TIN	7440-31-5	0	0	0	0	0	0	0	0	0	0	0	0
VANADIUM	7440-62-2	30.700	16.700	26.800	20.600	22.300	20	20	22.700	18.500	20.800	22.100	28.700
ZINC	7440-66-6	71.800	39.500	75.300	22.300	31.900	24.400	21	23.800	21.100	19	0.600J	28.900
CYANIDE		0.700U	0.700U	78.200	0.600U	5	0.600U	0.600U	0.500J	0.600U	0.600U	0.600U	0.600U
HARDNESS		0	0	0	0	0	0	0	0	0	0	0	0
ALKALINITY		0	0	0	0	0	0	0	0	0	0	0	0

R - DATA IS UNUSABLE DUE TO QA/QC OUT OF CONTROL LIMITS.
J - REPORTED CONCENTRATIONS OR DETECTION LIMITS ARE ESTIMATES DUE TO QA/QC OUT OF CONTROL LIMITS.
B - CONCENTRATION IN SAMPLE ATTRIBUTABLE TO BLANK CONTAMINATION.
U - NOT DETECTED; VALUE REPORTED IS THE DETECTION LIMIT.

INORGANIC ANALYSIS SUMMARY FOR SOIL

SITE NAME AND NUMBER: AIR CENTER, INC
CASE NUMBER: 8811 PAGE 2 OF 2
CONCENTRATIONS IN PARTS PER MILLION (PPM)

TRAFFIC REPORT NUMBER AND STATION LOCATION.

		MFF 449 27 STA 27 SAMPLE LOCATION 27	MFF 450 28 STA 28 SAMPLE LOCATION 28	MFF 451 29 STA 29 SAMPLE LOCATION 29	MFF 453 30 STA 30 SAMPLE LOCATION 30	MFF 455 16 STA 16 SAMPLE LOCATION 16							
	MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL							
	% MOISTURE	18	19	21	14	29	0	0	0	0	0	0	0
	CAS NO.												
ALUMINUM	7429-90-5	21600	8570	11900	12200	11600	0	0	0	0	0	0	0
ANTIMONY	7440-36-0	0R	0R	0R	0R	0R	0	0	0	0	0	0	0
ARSENIC	7440-38-2	1.200UJ	3.400J	5.400J	8.400J	7.400J	0	0	0	0	0	0	0
BARIUM	7440-39-3	158	146	109	105	112	0	0	0	0	0	0	0
BERYLLIUM	7440-41-7	0.980	0.490U	0.510U	0.470U	0.560	0	0	0	0	0	0	0
CADMIUM	7440-43-9	1.200UJ	1.200UJ	1.300J	1.200UJ	1.400UJ	0	0	0	0	0	0	0
CALCIUM	7440-70-2	2830	2760	2980	2450	8720	0	0	0	0	0	0	0
CHROMIUM	7440-47-3	0R	0R	0R	0R	0R	0	0	0	0	0	0	0
COBALT	7440-48-4	4.900U	7.700	6.600	6.100	5.600U	0	0	0	0	0	0	0
COPPER	7440-50-8	9.800	7.200	10.700	5.400	7.600	0	0	0	0	0	0	0
IRON	7439-89-6	17600	10200	12300	9900	11800	0	0	0	0	0	0	0
LEAD	7439-92-1	0R	0R	0R	0R	0R	0	0	0	0	0	0	0
MAGNESIUM	7439-95-4	2160	1180	1490	1480	3410	0	0	0	0	0	0	0
MANGANESE	7439-96-5	112	897	212	205	131	0	0	0	0	0	0	0
MERCURY	7439-97-6	0.120U	0.120U	0.130U	0.120U	0.140U	0	0	0	0	0	0	0
NICKEL	7440-02-0	5.200UJ	14.600J	17.200J	4.900UJ	5.900UJ	0	0	0	0	0	0	0
POTASSIUM	7440-09-7	1350	989	1340	1880	2000	0	0	0	0	0	0	0
SELENIUM	7782-49-2	0R	0R	0R	0R	0R	0	0	0	0	0	0	0
SILVER	7440-22-4	0R	0R	0R	0R	0R	0	0	0	0	0	0	0
SODIUM	7440-23-5	108	69.200U	71.100U	65.300U	78.500U	0	0	0	0	0	0	0
THALLIUM	7440-28-0	1.200U	1.200U	1.300U	1.200U	1.400U	0	0	0	0	0	0	0
TIN	7440-31-5	0	0	0	0	0	0	0	0	0	0	0	0
VANADIUM	7440-62-2	26.800	20.300	22.300	18.200	19.600	0	0	0	0	0	0	0
ZINC	7440-66-6	27.500	58.100	68	24.900	33.700	0	0	0	0	0	0	0
CYANIDE		0.600U	4.700	3	0.600U	0.700U	0	0	0	0	0	0	0
HARDNESS		0	0	0	0	0	0	0	0	0	0	0	0
ALKALINITY		0	0	0	0	0	0	0	0	0	0	0	0

R - DATA IS UNUSABLE DUE TO QA/QC OUT OF CONTROL LIMITS.
J - REPORTED CONCENTRATIONS OR DETECTION LIMITS ARE ESTIMATES DUE TO QA/QC OUT OF CONTROL LIMITS.
B - CONCENTRATION IN SAMPLE ATTRIBUTABLE TO BLANK CONTAMINATION.
U - NOT DETECTED; VALUE REPORTED IS THE DETECTION LIMIT.

DATA QUALITY ASSURANCE REVIEW

SITE NAME Air Center Oklahoma City, OK.

SITE CODE OKD980750319

PAN IOK0270SBF

CASE NUMBER 8811

LABORATORY ETC/TOXICON

SAMPLE NUMBERS

WATER	FG 236	FG 247	FG 257
FG 260	FG 237	FG 248	FG 258
FG 262	FG 238	FG 249	FG 259
FG 266	FG 239	FG 250	FG 260
FG 267	FG 240	FG 251	FG 261
FG 095	FG 241	FG 252	FG 262
SOIL	FG 242	FG 253	FG 263
FG 094	FG 243	FG 254	FG 264
FG 096	FG 244	FG 255	FG 265
FG 235	FG 246	FG 256	FG 266
			FG 267

REVIEWER Shadi Nikfarjam, ICF Technology

DATA EVALUATION

SITE NAME Air Center CASE NO. 8811 PAGE 1 of 3

This package consists of thirty (30) soil and five (5) water samples, analyzed for TCL compounds with exception of pesticides and PCBs. All samples were analyzed at low concentrations.

1) MS Calibration: Contractual violations were noted in that percent differences in mean and daily response factors for calibration check compounds were out of control limits and a new initial calibration was not conducted. None of these compounds were detected in the samples however.

Numerous other compounds with calibration criteria out of control limits were noted in both initial and continuing calibrations of the VOA and ABN fractions. Compounds detected in samples affected include 2-butanone, acetone, methylene chloride, tetrachloroethene, total xylene, butyl benzyl phthalate, bis(2-ethylhexyl) phthalate and 2-methyl naphthalene. Sample concentrations of these compounds in which the associated calibration is out of control limits are considered estimates (J flag).

2) SURROGATE RECOVERIES: 5 out of 6 ABN surrogate recoveries were out of control limits for sample FG 252. Since matrix spike/matrix spike duplicate (MS/MSD) analysis was conducted on this sample, reanalysis was not conducted. Surrogate recoveries were acceptable in the MS/MSD analysis. All ABN fraction results for this sample are considered estimates (J flag) and may be biased low. False negative results are possible.

Two acid surrogate recoveries were out of control limits (low) in sample FG 255.

DATA EVALUATION

The contractually required re-extraction and reanalysis of this sample was not conducted. All acid compound results for this sample are considered estimates (J flag) and may be biased possible low. Two acid and one base/neutral surrogate recoveries were out of control limit

3) BLANKS: Acetone was detected in 6 of the 7 VOA method blanks at concentrations ranging from 2 to 6 ppb. Sample concentrations of acetone less than 10 times its concentration in the associated method blank are flagged "B".

Methylene chloride was detected in 4 of the 7 VOA method blank. Sample concentrations of methylene chloride less than 10 times its concentration in the associated method blank are flagged "B".

2-Butanone in sample FG 246 is flagged B due to the presence of 2-butanone in the associated method blank.

Tentatively identified compounds (TICs) were detected in all four of the ABN method blanks. Sample concentrations of the these TICs less than 5 times their concentration in the associated method blank are flagged "B".

4) MS/MSD: The relative percent difference for all five VOA water spike compounds were out of control limits, however, recoveries were within limits. MS recoveries were generally greater than 100% while MSD recoveries were all less than 90%, indicating possibly poor spiking technique by the laboratory. Since surrogate recoveries for the water samples were within control limits,

DATA EVALUATION

the data should not be significantly affected.

5) All other QA/QC requirements were within control limits.

[illegible]

SITE NAME: AIF CENTER
CASE NUMBER 8911 PAGE 1 OF 9
CONCENTRATIONS IN PARTS PER BILLION

ORGANIC TRAFFIC NUMBERS
AND SAMPLE STATION LOCATION DESCRIPTIONS

			IFG 094	IFG 095	IFG 096	IFG 235	IFG 236	IFG 237	IFG 238	IFG 239	IFG 240	IFG 241	IFG 242	IFG 243
			NE END OF SPILLWAY	NE END OF SPILLWAY	MOUTH OF DRAINAGE DITCH	SE END OF POND	NE EDGE OF POND	EDGE OF POND	SW SIDE OF SPILLWAY	NE SIDE OF SPILLWAY	MOUTH OF DRAINAGE DITCH	EAST EDGE OF SWAMPY AREA	MOUTH OF DRAINAGE DITCH	BANK, SOUTH OF STATION 04
		MATRIX	SOIL	WATER	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COMPOUND	CAS#/SCAN	CLASS												
BENZENE	71-43-2	VOA/1					9J	8J		8J	9J	11J		
1,1,1-TRICHLOROETHANE	71-55-6	VOA/1												
CHLOROFORM	67-66-3	VOA/1												
TRANS-1,2-DICHLOROETHENE	156-60-5	VOA/1												
ETHYLBENZENE	100-41-4	VOA/1												
METHYLENE CHLORIDE	75-09-2	VOA/1	5JB	1J	21JB	7JB	13JB	21JB	35JB	23JB	20JB	27JB	80JB	38JB
TETRACHLOROETHENE	127-18-4	VOA/1												
TOLUENE	108-88-3	VOA/1												
ACETONE	67-64-1	VOA/2				4JB				8JB	9JB	17JB	17JB	7BJ
2-BUTANONE	78-93-3	VOA/2												
CARBONDISULFIDE	75-15-0	VOA/2												
TOTAL XYLENES	1330-20-7	VOA/2												
PHENOL	108-95-2	ABN/1												1200J
FLUORANTHENE	206-44-0	ABN/1					2200J							
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	ABN/1												
BENZYL BUTYL PHTHALATE	85-68-7	ABN/1												
BENZO(A)ANTHRACENE	56-55-3	ABN/1					570J							
CHRYSENE	218-01-9	ABN/1					770J							
PYRENE	129-00-0	ABN/1					1700J							
BENZOIC ACID	65-85-0	ABN/2												
2-METHYLNAPHTHALENE	91-57-6	ABN/2												
TRIMETHYL SILANOL	254	VOA/3			7JB			7J	7JB	8JB			16JB	8JB
HEXANE	340	VOA/3							6J					
UNKNOWN	505	VOA/3											16J	
UNKNOWN	572	VOA/3												
UNKNOWN	593	VOA/3												
2-CYCLOHEXENE-1-OL	501	ABN/3		16J										
UNKNOWN	504	ABN/3												
UNKNOWN	512	ABN/3												
UNKNOWN	544	ABN/3											470J	
4-METHYL-4-PENTENE-2-ONE	562	ABN/3		18J										420J
UNKNOWN	622	ABN/3											3900J	
UNKNOWN	641	ABN/3	7500JB		9900JB	9300JB	8000JB	9200JB	8800JB	8500JB	8800JB	14000JB		7700J
2-HYDROXY CYCLOHEXANONE	672	ABN/3												210J
UNKNOWN	704	ABN/3												470J
UNKNOWN	733	ABN/3												
1,2-BENZENEDIOL	924	ABN/3												830J
UNKNOWN	970	ABN/3												
UNKNOWN	1016	ABN/3												
2-HYDROXYBENZOIC ACID	1049	ABN/3												1300J

1 PRIORITY POLLUTANT
2 RECIPIED HAZARDOUS SUBSTANCE
3 TENTATIVELY IDENTIFIED

VOA - VOLATILE
ABN - ACID/BASE/NEUTRAL
PES - PESTICIDE

B - THE ANALYTE IS FOUND IN THE LAB BLANK
J - INDICATES AN ESTIMATED VALUE FOR TENTATIVELY IDENTIFIED COMPOUNDS OR COMPOUNDS FOUND BELOW CONTRACT DETECTION LIMIT
P - PRESENT IN SAMPLE, BUT NOT REPORTED BY LAB

C - CONFIRMED BY MASS SPECTRAL DATA

ORGANIC ANALYSIS SUMMARY

SITE NAME: AIP CENTER
CASE NUMBER 8911
CONCENTRATIONS IN PARTS PER BILLION

ORGANIC TRAFFIC NUMBERS
AND SAMPLE STATION LOCATION DESCRIPTIONS

COMPOUND	CAS#/SCAN CLASS	FG 094 NE END OF SPILLWAY	FG 095 NE END OF SPILLWAY	FG 096 MOUTH OF DRAINAGE DITCH	FG 235 SE END OF POND	FG 236 NE EDGE OF POND	FG 237 EDGE OF POND	FG 238 SW SIDE OF SPILLWAY	FG 239 NE SIDE OF SPILLWAY	FG 240 MOUTH OF DRAINAGE DITCH	FG 241 EAST EDGE OF SWAMPY AREA	FG 242 MOUTH OF DRAINAGE DITCH	FG 243 BANK, SOUTH OF STATION #4
	MATRIX	SOIL	WATER	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
UNKNOWN	1077 ABN/31												380J
UNKNOWN	1149 ABN/31												460J
UNKNOWN	1187 ABN/31												280J
UNKNOWN	1250 ABN/31							190J					500J
1,2,3,4-TETRAHYDRO-1,6-DI	1279 ABN/31										360J		
UNKNOWN	1333 ABN/31												
UNKNOWN	1499 ABN/31												
UNKNOWN	1597 ABN/31												
UNKNOWN	1529 ABN/31												
UNKNOWN	1642 ABN/31					230J							
UNKNOWN	1650 ABN/31										340J		960J
UNKNOWN	1737 ABN/31										460J		
MOLECULAR SULFUR	1750 ABN/31				1000J	200J	270J				460J	2100J	340J
UNKNOWN	1752 ABN/31												
ALKANE	1760 ABN/31												
UNKNOWN	1778 ABN/31										300J		
UNKNOWN	1819 ABN/31			780J									
ALKANE	1835 ABN/31												
UNKNOWN	1870 ABN/31					230J							
ALKANE	1950 ABN/31												
UNKNOWN	1989 ABN/31												
ALKANE	1857 ABN/31												
ALKANE	1905 ABN/31												
UNKNOWN	1925 ABN/31												
ALKANE	1947 ABN/31												
UNKNOWN	1959 ABN/31			590J									
ALKANE	1973 ABN/31												
UNKNOWN	1989 ABN/31										680J		
ALKANE	2032 ABN/31												
ALKANE	2038 ABN/31												
UNKNOWN	2053 ABN/31			1300J									
UNKNOWN	2094 ABN/31												
UNKNOWN	2101 ABN/31												
NONADECANE	2136 ABN/31												
NONADECANE	2137 ABN/31										380J	380J	
ALKANE	2154 ABN/31	400J						190J		470J	1000J		370J
ALKANE	2193 ABN/31												
ALKANE	2213 ABN/31									240J		710J	
4,8,12-TRIMETHYL-3,7,11-T	2230 ABN/31			490J			300J	590J		430J	680J		430J
ALKANE	2249 ABN/31												

1 PRIORITY POLLUTANT
2 SPECIFIED HAZARDOUS SUBSTANCE
3 TENTATIVELY IDENTIFIED

VOA - VOLATILE
ABN - ACID/BASE/NEUTRAL
PES - PESTICIDE

B - THE ANALYTE IS FOUND IN THE LAB BLANK
J - INDICATES AN ESTIMATED VALUE FOR TENTATIVELY IDENTIFIED COMPOUNDS OR COMPOUNDS FOUND BELOW CONTRACT DETECTION LIMIT
P - PRESENT IN SAMPLE, BUT NOT REPORTED BY LAB

C - CONFIRMED BY MASS SPECTRAL DATA

ORGANIC ANALYSIS SUMMARY

SITE NAME: AIR CENTER
CASE NUMBER 8811 PAGE 3 OF 9
CONCENTRATIONS IN PARTS PER BILLION

ORGANIC TRAFFIC NUMBERS
AND SAMPLE STATION LOCATION DESCRIPTIONS

		IFG 094	IFG 095	IFG 096	IFG 235	IFG 236	IFG 237	IFG 238	IFG 239	IFG 240	IFG 241	IFG 242	IFG 243
		NE END OF SPILLWAY	NE END OF SPILLWAY	MOUTH OF DRAINAGE DITCH	SE END OF POND	NE EDGE OF POND	EDGE OF POND	SW SIDE OF SPILLWAY	NE SIDE OF SPILLWAY	MOUTH OF DRAINAGE DITCH	EAST EDGE OF SWAMPY AREA	MOUTH DRAINAGE DITCH	BANK, SOUTH OF STATION #4
	MATRIX	SOIL	WATER	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COMPOUND	CAS#/SCAN CLASS												
ALKANE	2270 ABN/3	3200J			470J	530J	620J	200J	200J	3900J	3100J	1500J	2200J
UNKNOWN	2286 ABN/3					300J							
ALKANE	2306 ABN/3												
ALKANE	2333 ABN/3										300J		
ALKANE	2372 ABN/3												
ALKANE	2375 ABN/3											290J	
ALKANE	2405 ABN/3	350J			190J				200J	560J	890J		630J
2,6,10,14-TETRAMETHYLHEXA	2451 ABN/3												
UNKNOWN	2544 ABN/3				950J					230J			
UNKNOWN	2563 ABN/3											740J	
UNKNOWN	2598 ABN/3								200J				
UNKNOWN	2600 ABN/3	800J		210J		610J	390J	2400J		300J	1730J		510J
UNKNOWN	2630 ABN/3					190J		480J			800J	2240J	
ALKANE	2657 ABN/3												
UNKNOWN	2684 ABN/3										630J		
UNKNOWN	2697 ABN/3												490J

1. PRIORITY POLLUTANT
2. SPECIFIED HAZARDOUS SUBSTANCE
3. TENTATIVELY IDENTIFIED

VOA - VOLATILE
ABN - ACID/BASE/NEUTRAL
PES - PESTICIDE

B - THE ANALYTE IS FOUND IN THE LAB BLANK
J - INDICATES AN ESTIMATED VALUE FOR TENTATIVELY IDENTIFIED COMPOUNDS OR COMPOUNDS FOUND BELOW CONTRACT DETECTION LIMIT
P - PRESENT IN SAMPLE, BUT NOT REPORTED BY LAB

C - CONFIRMED BY MASS SPECTRAL DATA

ORGANIC ANALYSIS SUMMARY

SITE NAME: AIR CENTER
CASE NUMBER 8911 PAGE 4 OF 9
CONCENTRATIONS IN PARTS PER BILLION

ORGANIC TRAFFIC NUMBERS AND SAMPLE STATION LOCATION DESCRIPTIONS

COMPOUND	CAS#/SCAN	CLASS	FG 244	FG 246	FG 247	FG 248	FG 249	FG 250	FG 257	FG 252	FG 253	FG 254	FG 255	FG 256
			NE CORNER OF SITE	OVERFLOW VALVE. LOWER POND	INLET INTO UPPER POND	SE SLOPE OF LAGOON	SE SIDE OF DRAINAGE DITCH	SE EDGE OF LAGOON DEPRESSION	SW CORNER OF LAGOON AT 1 FT.	SW CORNER OF LAGOON AT 6 FT.	SOUTH CENTRAL AT 1 FT.	SOUTH CENTRAL AT 6 FT.	SOUTH CENTRAL AT 6 FT.	NW CORNER OF LAGOON
		MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
BENZENE	71-43-2	VOA 1												
1,1,1-TRICHLOROETHANE	71-55-6	VOA/1												
CHLOROFORM	67-66-3	VOA/1												
TRANS-1,2-DICHLOROETHENE	156-60-5	VOA/1												
ETHYLBENZENE	100-41-4	VOA/1												
METHYLENE CHLORIDE	75-09-2	VOA/1	7JB	14JB	7JB	5JB	6JB	8JB	.8JB,	6JB	6JB	6JB	9JB	7JB
TETRACHLOROETHENE	127-18-4	VOA/1												
TOLUENE	108-88-3	VOA/1												
ACETONE	67-64-1	VOA/2	5JB	21JB	5JB	3JB	4JB	5JB	4JB	6JB	6JB	6JB	7JB	6JB
2-BUTANONE	78-93-3	VOA/2		6JB										
CARBON DISULFIDE	75-15-0	VOA/2												
TOTAL XYLENES	1330-20-7	VOA/2												
PHENOL	108-95-2	ABN/1			10000J									
FLUORANTHENE	206-44-0	ABN/1												
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	ABN/1												
BENZYL BUTYL PHTHALATE	85-68-7	ABN/1												
BENZO(A)ANTHRACENE	56-55-3	ABN/1												
CHRYSENE	218-01-9	ABN/1												
PYRENE	129-00-0	ABN/1												
BENZOIC ACID	65-85-0	ABN/2												
2-METHYLNAPHTHALENE	91-57-6	ABN/2												
TRIMETHYL SILANOL	254	VOA/3		10JB										
HEXANE	340	VOA/3						6J						
UNKNOWN	505	VOA/3												
UNKNOWN	572	VOA/3												
UNKNOWN	598	VOA/3												
2-CYCLOHEXENE-1-OL	501	ABN/3												
UNKNOWN	504	ABN/3												
UNKNOWN	512	ABN/3												
UNKNOWN	541	ABN/3												
4-METHYL-4-PENTENE-2-ONE	562	ABN/3	290JB	330JB										
UNKNOWN	638	ABN/3												
UNKNOWN	641	ABN/3	6200JB	8500JB	5900JB	8000JB	9200JB	7600JB	4900JB	1700JB	6300JB	6000JB	2300JB	6800JB
2-HYDROXY CYCLOHEXANONE	672	ABN/3												
UNKNOWN	704	ABN/3												
UNKNOWN	733	ABN/3												
1,2-DIBENZENEDIOL	934	ABN/3												
UNKNOWN	970	ABN/3												
UNKNOWN	1016	ABN/3												
2-HYDROXYBENZOIC ACID	1069	ABN/3												

1. PRIORITY POLLUTANT
2. SPECIFIED HAZARDOUS SUBSTANCE
3. TENTATIVELY IDENTIFIED

VOA - VOLATILE
ABN - ACID/BASE/NEUTRAL
PES - PESTICIDE

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J - INDICATES AN ESTIMATED VALUE FOR TENTATIVELY IDENTIFIED COMPOUNDS OR COMPOUNDS FOUND BELOW CONTRACT DETECTION LIMIT
P - PRESENT IN SAMPLE, BUT NOT REPORTED BY LAB

C - CONFIRMED BY MASS SPECTRAL DATA

SITE NAME: AIR CENTER
CASE NUMBER 6811 PAGE 5 OF 9
CONCENTRATIONS IN PARTS PER BILLION

ORGANIC TRAFFIC NUMBERS
AND SAMPLE STATION LOCATION DESCRIPTIONS

COMPOUND	CAS#/SCAN	CLASS	IFG 244 NE CORNER OF SITE	IFG 246 OVERFLOW VALVE, LOWER POND	IFG 247 INLET INTO UPPER POND	IFG 248 SE SLOPE OF LAGOON	IFG 249 SE SIDE OF DRAINAGE DITCH	IFG 250 SE EDGE OF LAGOON DEPRESSION	IFG 251 SW CORNER OF LAGOON AT 1 FT.	IFG 252 SW CORNER OF LAGOON AT 6 FT.	IFG 253 SOUTH CENTRAL AT 1 FT.	IFG 254 SOUTH CENTRAL AT 6 FT.	IFG 255 SOUTH CENTRAL AT 6 FT.	IFG 256 NW CORNER OF LAGOON
MATRIX			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
UNKNOWN	1077	ABN/3												
UNKNOWN	1149	ABN/3												
UNKNOWN	1187	ABN/3												
UNKNOWN	1250	ABN/3												
1,2,3,4-TETRAHYDRO-1,6-DI	1279	ABN/3												
UNKNOWN	1333	ABN/3												
UNKNOWN	1479	ABN/3												
UNKNOWN	1597	ABN/3												
UNKNOWN	1629	ABN/3												
UNKNOWN	1642	ABN/3												
UNKNOWN	1650	ABN/3												
UNKNOWN	1737	ABN/3												
MOLECULAR SULFUR	1750	ABN/3												
UNKNOWN	1752	ABN/3			500J									
ALKANE	1760	ABN/3			1300J									
UNKNOWN	1778	ABN/3												
UNKNOWN	1819	ABN/3												
ALKANE	1835	ABN/3			4200J									
UNKNOWN	1870	ABN/3			540J									
ALKANE	1880	ABN/3												
UNKNOWN	1889	ABN/3					270J							
ALKANE	1897	ABN/3			680J						860J			
ALKANE	1905	ABN/3			5900J									
UNKNOWN	1925	ABN/3			460J									
ALKANE	1947	ABN/3												
UNKNOWN	1959	ABN/3			790J		250J				700J			
ALKANE	1973	ABN/3			7200J									
UNKNOWN	1989	ABN/3												
ALKANE	2032	ABN/3					230J							
ALKANE	2038	ABN/3			6000J									
UNKNOWN	2053	ABN/3												
UNKNOWN	2094	ABN/3					180J							
UNKNOWN	2101	ABN/3			4100J									
NONADECANE	2136	ABN/3		570J										
NONADECANE	2137	ABN/3	380J											
ALKANE	2154	ABN/3	350J	700J	3200J		270J				210J			
ALKANE	2173	ABN/3												
ALKANE	2213	ABN/3			2100J							240J		
4,8,12-TRIMETHYL-3,7,11-T	2230	ABN/3				62JB	260JB				410JB			
ALKANE	2347	ABN/3												

1. PRIORITY POLLUTANT
2. SPECIFIED HAZARDOUS SUBSTANCE
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CONCENTRATIONS IN PARTS PER BILLION

ORGANIC TRAFFIC NUMBERS
AND SAMPLE STATION LOCATION DESCRIPTIONS

			FG 244	FG 246	FG 247	FG 248	FG 249	FG 250	FG 257	FG 252	FG 253	FG 254	FG 255	FG 256
			NE CORNER OF SITE	OVERFLOW VALVE, LOWER POND	INLET INTO UPPER POND	SE SLOPE OF LAGOON	SE SIDE OF DRAINAGE DITCH	SE EDGE OF LAGOON DEPRESSION	SW CORNER OF LAGOON AT 1 FT.	SW CORNER OF LAGOON AT 6 FT.	SOUTH CENTRAL AT 1 FT.	SOUTH CENTRAL AT 6 FT.	SOUTH CENTRAL AT 6 FT.	NW CORNER OF LAGOON
		MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
COMPOUND	CAS#/SCAN	CLASS												
ALKANE	2270	ABN/3	4900J	4200J	1600J		600J				270J			
UNKNOWN	2285	ABN/3												
ALKANE	2306	ABN/3				1200J								
ALKANE	2333	ABN/3			470J									
ALKANE	2373	ABN/3												
ALKANE	2375	ABN/3												
ALKANE	2405	ABN/3	730J	460J	430J									
2,6,10,14-TETRAMETHYLHEXA	2451	ABN/3												
UNKNOWN	2544	ABN/3		340J										
UNKNOWN	2563	ABN/3												
UNKNOWN	2598	ABN/3												
UNKNOWN	2600	ABN/3			1800J		1300J	720J	550J	400J	510J	1200J	720J	420J
UNKNOWN	2630	ABN/3				230J								
ALKANE	2657	ABN/3												
UNKNOWN	2694	ABN/3												
UNKNOWN	2697	ABN/3												

1. PRIORITY POLLUTANT
2. SPECIFIED HAZARDOUS SUBSTANCE
3. TENTATIVELY IDENTIFIED

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ORGANIC ANALYSIS SUMMARY

SITE NAME: AIP CENTER
CASE NUMBER 3B11
CONCENTRATIONS IN PARTS PER BILLION

ORGANIC TRAFFIC NUMBERS AND SAMPLE STATION LOCATION DESCRIPTIONS

COMPOUND	CAS#/SCAN	CLASS	IFG 257	IFG 258	IFG 259	IFG 260	IFG 261	IFG 262	IFG 263	IFG 264	IFG 265	IFG 266	IFG 267
			NW CORNER OF LAGOON	DRAINAGE DITCH, CONCRETE PIPE	DRAINAGE DITCH	UST #1	EAST OF SE HANGER	UST #2	OVERFLOW VALVE, UPPER POND SW SIDE	NORTH OF PAINT STRIPING AREA AT 1 FT.	NORTH OF PAINT STRIPING AREA AT 6 FT.	TRIP BLANK	NE CORNER OF SITE
		MATRIX	SOIL	SOIL	SOIL	WATER	SOIL	WATER	SOIL	SOIL	SOIL	WATER	WATER
BENZENE	71-43-2	VOA/1											
1,1,1-TRICHLOROETHANE	71-55-6	VOA/1										1J	
CHLOROFORM	67-66-3	VOA/1										1J	
TRANS-1,2-DICHLOROETHENE	156-60-5	VOA/1				2J		2J					
ETHYLBENZENE	100-41-4	VOA/1				6J		7J					
METHYLENE CHLORIDE	75-09-2	VOA/1	8JB	7JB	7JB	3J	11JB		18JB	6JB	4JB	5J	2J
TETRACHLOROETHENE	127-18-4	VOA/1				2J							
TOLUENE	108-88-3	VOA/1				1J		5J				2J	
ACETONE	67-64-1	VOA/2	4JB	5JB	5JB	19JB	6JB	11JB	6JB	5JB		2JB	4JB
2-BUTANONE	78-93-3	VOA/2											
CARBONDISULFIDE	75-15-0	VOA/2				2J							
TOTAL XYLENES	1330-20-7	VOA/2				41J		47J					
PHENOL	108-95-2	ABN/1		2700J	3500J	46J		62J					
FLUORANTHENE	206-44-0	ABN/1											
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	ABN/1		150J	220J								
BENZYL BUTYL PHTHALATE	85-68-7	ABN/1		110J									
BENZO(A)ANTHRACENE	56-55-3	ABN/1											
CHRYSENE	218-01-9	ABN/1											
PYRENE	129-00-0	ABN/1											
BENZOIC ACID	65-85-0	ABN/2				14J							
2-METHYLNAPHTHALENE	91-57-6	ABN/2				35J		42J					
TRIMETHYL SILANOL	254	VOA/3									6J		
HEXANE	340	VOA/3											
UNKNOWN	505	VOA/3											
UNKNOWN	572	VOA/3						15J					
UNKNOWN	598	VOA/3				7J		8J					
2-CYCLOHEXENE-1-OL	501	ABN/3						22J				17J	
UNKNOWN	504	ABN/3				28J							
UNKNOWN	512	ABN/3						10J					
UNKNOWN	544	ABN/3											
4-METHYL-4-PENTENE-2-ONE	562	ABN/3		200JB	460JB			19J				20J	
UNKNOWN	628	ABN/3											
UNKNOWN	641	ABN/3	9100JB	5300JB	3800JB	110J			6900JB	2500JB	2300JB		
2-HYDROXY CYCLOHEXANONE	672	ABN/3											
UNKNOWN	704	ABN/3				150J		190J					
UNKNOWN	733	ABN/3											13J
1,2-DIBENZENEDIOL	924	ABN/3											
UNKNOWN	970	ABN/3				18J		16J					
UNKNOWN	1016	ABN/3						11J					
2-HYDROXYBENZOIC ACID	1049	ABN/3											

1. PRIORITY POLLUTANT
2. SPECIFIED HAZARDOUS SUBSTANCE
3. TENTATIVELY IDENTIFIED

VOA - VOLATILE
ABN - ACID/BASE/NEUTRAL
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B - THE ANALYTE IS FOUND IN THE LAB BLANK
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P - PRESENT IN SAMPLE, BUT NOT REPORTED BY LAB

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ORGANIC ANALYSIS SUMMARY

SITE NAME: AIR CENTER
CASE NUMBER 8811
CONCENTRATIONS IN PARTS PER BILLION

ORGANIC TRAFFIC NUMBERS
AND SAMPLE STATION LOCATION DESCRIPTIONS

		IFG 257	IFG 258	IFG 259	IFG 260	IFG 261	IFG 262	IFG 263	IFG 264	IFG 265	IFG 266	IFG 267
		NW CORNER OF LAGOON	DRAINAGE DITCH, CONCRETE PIPE	DRAINAGE DITCH	UST #1	EAST OF SE HANGER	UST #2	OVERFLOW VALVE, UPPER POND SW SIDE	NORTH OF PAINT STRIPPING AREA AT 1 FT.	NORTH OF PAINT STRIPPING AREA AT 6 FT.	TRIP BLANK	NE CORNER OF SITE
	MATRIX	SOIL	SOIL	SOIL	WATER	SOIL	WATER	SOIL	SOIL	SOIL	WATER	WATER
COMPOUND	CAS#/SCAN CLASS											
UNKNOWN	1077 ABN/3											
UNKNOWN	1149 ABN/3											
UNKNOWN	1187 ABN/3											
UNKNOWN	1260 ABN/3											
1,2,3,4-TETRAHYDRO-1,6-DI	1279 ABN/3											
UNKNOWN	1333 ABN/3			210J			13J					
UNKNOWN	1499 ABN/3			2400J								
UNKNOWN	1597 ABN/3		180J									
UNKNOWN	1629 ABN/3			300J			7J					
UNKNOWN	1642 ABN/3											
UNKNOWN	1650 ABN/3											
UNKNOWN	1737 ABN/3											
MOLECULAR SULFUR	1750 ABN/3											
UNKNOWN	1752 ABN/3											
ALKANE	1760 ABN/3		190J									
UNKNOWN	1778 ABN/3											
UNKNOWN	1819 ABN/3			170J								
ALKANE	1835 ABN/3		430J									
UNKNOWN	1870 ABN/3											
ALKANE	1880 ABN/3			430J								
UNKNOWN	1889 ABN/3											
ALKANE	1897 ABN/3		310J									
ALKANE	1905 ABN/3		460J									
UNKNOWN	1925 ABN/3											
ALKANE	1947 ABN/3			1000J								
UNKNOWN	1959 ABN/3											
ALKANE	1973 ABN/3		430J									
UNKNOWN	1989 ABN/3											
ALKANE	2032 ABN/3											
ALKANE	2038 ABN/3		460J									
UNKNOWN	2053 ABN/3					160J						
UNKNOWN	2094 ABN/3		350J	1700J								
UNKNOWN	2101 ABN/3											
NONADECANE	2136 ABN/3											
NONADECANE	2137 ABN/3											
ALKANE	2154 ABN/3		300J	1800J								
ALKANE	2193 ABN/3			4000J								
ALKANE	2213 ABN/3		210J									
4,8,12-TRIMETHYL-3,7,11-T	2230 ABN/3								200JB			
ALKANE	2249 ABN/3			3700J				1000J				

1. PRIORITY POLLUTANT
2. SPECIFIED HAZARDOUS SUBSTANCE
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ORGANIC ANALYSIS SUMMARY

SITE NAME: AIR CENTER
CASE NUMBER 8811 PAGE [illegible] OF 9
CONCENTRATIONS IN PARTS PER BILLION

ORGANIC TRAFFIC NUMBERS AND SAMPLE STATION LOCATION DESCRIPTIONS

		IFG 257	IFG 258	IFG 259	IFG 260	IFG 261	IFG 262	IFG 263	IFG 264	IFG 265	IFG 266	IFG 267	
		NW CORNER OF LAGOON	DRAINAGE DITCH, CONCRETE PIPE	DRAINAGE DITCH	UST #1	EAST OF SE HANGER	UST #2	OVERFLOW VALVE, UPPER POND SW SIDE	NORTH OF PAINT STRIPPING AREA AT 1 FT.	NORTH OF PAINT STRIPPING AREA AT 6 FT.	TRIP BLANK	NE CORNER OF SITE	
	MATRIX	SOIL	SOIL	SOIL	WATER	SOIL	WATER	SOIL	SOIL	SOIL	WATER	WATER	
COMPOUND	CAS#/SCAN CLASS												
ALKANE	2270 ABN/31		390J										
UNKNOWN	2286 ABN/31												
ALKANE	2306 ABN/31			2300J									
ALKANE	2333 ABN/31												
ALKANE	2373 ABN/31			1800J									
ALKANE	2375 ABN/31												
ALKANE	2405 ABN/31		290J					790J					
2,6,10,14-TETRAMETHYLHEXA	2451 ABN/31			1310J									
UNKNOWN	2544 ABN/31			1100J									
UNKNOWN	2563 ABN/31												
UNKNOWN	2598 ABN/31												
UNKNOWN	2600 ABN/31	2200J	1100J			980J		1100J	350J				
UNKNOWN	2630 ABN/31												
ALKANE	2657 ABN/31			230J									
UNKNOWN	2684 ABN/31												
UNKNOWN	2697 ABN/31												

1. PRIORITY POLLUTANT
2. SPECIFIED HAZARDOUS SUBSTANCE
3. TENTATIVELY IDENTIFIED

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[illegible]

SITE NAME AND NUMBER: AIR CENTER
CASE NUMBER: [illegible] PAGE 1 OF 1
CONCENTRATIONS IN PARTS PER BILLION (PPB)

TRAFFIC REPORT NUMBER AND STATION LOCATION.

		DRINKING WATER CRITERIA P - PRIMARY S - SECONDARY	1	2	3	4	5
			STATION #36 BETHANY WELL #21	[redacted] RESIDENTIAL WELL	STATION #38 BETHANY WELL #23A	STATION #35 STINCHCOMB WELL	[redacted] RESIDENTIAL WELL
	MATRIX		WATER	WATER	WATER	WATER	WATER
	% MOISTURE		100	100	100	100	100
	CAS NO.						
ALUMINUM	7429-90-5		162	126	1656	100U	100U
ANTIMONY	7440-36-0		60U	60U	60U	60U	60U
ARSENIC	7440-38-2	50P	17	6	3.400U	3.400U	3.400U
BARIUM	7440-39-3	1000P	209	21	67	52	223
BERYLLIUM	7440-41-7		5U	5U	5U	5U	5U
CADMIUM	7440-43-9	10P	5U	5U	19	5U	5U
CALCIUM	7440-70-2		135770	131650	50206	61859	66064
CHROMIUM	7440-47-3	50P	15	10U	10U	10U	10U
COBALT	7440-48-4		20U	20U	20U	20U	20U
COPPER	7440-50-8	1000S	2126	20U	221	20U	30
IRON	7439-89-6	300S	45318	132	5293	287	288
LEAD	7439-92-1	50P	176	30U	66	30U	30U
MAGNESIUM	7439-95-4		45443	53044	17241	28207	27899
MANGANESE	7439-96-5	50S	79	5U	65	5U	5U
MERCURY	7439-97-6	2P	0.200U	0.200U	0.200U	0.200U	0.200U
NICKEL	7440-02-0		20U	20U	20U	20U	20U
POTASSIUM	7440-09-7		1189	1000U	5336	1000U	1560
SELENIUM	7782-49-2	10P	2.500U	7	2.500U	2.500U	2.500U
SILVER	7440-22-4	50P	10U	10U	10U	10U	10U
SODIUM	7440-23-5		98701	174950	44345	105670	40906
THALLIUM	7440-28-0		3.600U	3.600U	3.600U	3.600U	3.600U
TIN	7440-31-5		162	40U	40U	40U	40U
VANADIUM	7440-62-2		48	30U	30U	30U	30U
ZINC	7440-66-6	5000S	43	120	338	49	133
CYANIDE			0.020U	0.020U	0.020U	0.020U	0.020U
HARDNESS			1930	636	232	32	320
ALKALINITY			393	237	216	264	226

R - DATA IS UNUSABLE DUE TO QA/QC OUT OF CONTROL LIMITS.
J - REPORTED CONCENTRATIONS OR DETECTION LIMITS ARE ESTIMATES DUE TO QA/QC OUT OF CONTROL LIMITS.
B - CONCENTRATION IN SAMPLE ATTRIBUTABLE TO BLANK CONTAMINATION.
U - NOT DETECTED; VALUE REPORTED IS THE DETECTION LIMIT.

[illegible]

SITE NAME AND NUMBER: AIR CENTER
CASE NUMBER: [illegible]   PAGE 2 OF 2
CONCENTRATIONS IN PARTS PER BILLION (PPB)

TRAFFIC REPORT NUMBER AND STATION LOCATION.

		DRINKING WATER CRITERIA P - PRIMARY S - SECONDARY	6 STATION #39 BETHANY WELL #236				
	MATRIX		WATER				
	% MOISTURE		100	0	0	0	0
	CAS NO.						
ALUMINUM	7429-90-5		100U	0	0	0	0
ANTIMONY	7440-36-0		60U	0	0	0	0
ARSENIC	7440-38-2	50P	4	0	0	0	0
BARIUM	7440-39-3	1000P	51	0	0	0	0
BERYLLIUM	7440-41-7		5U	0	0	0	0
CADMIUM	7440-43-9	10P	5U	0	0	0	0
CALCIUM	7440-70-2		43710	0	0	0	0
CHROMIUM	7440-47-3	50P	10U	0	0	0	0
COBALT	7440-48-4		20U	0	0	0	0
COPPER	7440-50-8	1000S	29	0	0	0	0
IRON	7439-89-6	300S	954	0	0	0	0
LEAD	7439-92-1	50P	30U	0	0	0	0
MAGNESIUM	7439-95-4		15897	0	0	0	0
MANGANESE	7439-96-5	50S	12	0	0	0	0
MERCURY	7439-97-6	2P	0.200U	0	0	0	0
NICKEL	7440-02-0		20U	0	0	0	0
POTASSIUM	7440-09-7		1946	0	0	0	0
SELENIUM	7782-49-2	10P	2.500U	0	0	0	0
SILVER	7440-22-4	50P	10U	0	0	0	0
SODIUM	7440-23-5		39031	0	0	0	0
THALLIUM	7440-28-0		3.600U	0	0	0	0
TIN	7440-31-5		40U	0	0	0	0
VANADIUM	7440-62-2		30U	0	0	0	0
ZINC	7440-66-6	5000S	73	0	0	0	0
CYANIDE			0.020U	0	0	0	0
HARDNESS			212	0	0	0	0
ALKALINITY			209	0	0	0	0

R - DATA IS UNUSABLE DUE TO QA/QC OUT OF CONTROL LIMITS.
J - REPORTED CONCENTRATIONS OR DETECTION LIMITS ARE ESTIMATES DUE TO QA/QC OUT OF CONTROL LIMITS.
B - CONCENTRATION IN SAMPLE ATTRIBUTABLE TO BLANK CONTAMINATION.
U - NOT DETECTED; VALUE REPORTED IS THE DETECTION LIMIT.

[illegible]

SITE NAME: AIR CENTER
CASE NUMBER ETFA0B10 PAGE 1 OF 2
CONCENTRATIONS IN PARTS PER BILLION

ORGANIC TRAFFIC NUMBERS
AND SAMPLE STATION LOCATION DESCRIPTIONS

		1	2	3	4	5
		STATION 25 BETHANY WELL #21	[redacted] RESIDENTIAL WELL	STATION #36 BETHANY WELL #23A	STATION #35 STINCHCOMB WELL	[redacted] RESIDENTIAL WELL
	MATRIX	WATER	WATER	WATER	WATER	WATER
COMPOUND	CAS#/SCAN CLASS					
BIS(2-ETHYLHEXYL)PHTHALAT117-81-7	ABN/1			28		
UNKNOWN	1345 ABN/3			56J		

1. PRIORITY POLLUTANT
2. SPECIFIED HAZARDOUS SUBSTANCE
3. TENTATIVELY IDENTIFIED

VOA - VOLATILE
ABN - ACID/BASE/NEUTRAL
PES - PESTICIDE

B - THE ANALYTE IS FOUND IN THE LAB BLANK
J - INDICATES AN ESTIMATED VALUE FOR TENTATIVELY IDENTIFIED COMPOUNDS OR COMPOUNDS FOUND BELOW CONTRACT DETECTION LIMIT
P - PRESENT IN SAMPLE, BUT NOT REPORTED BY LAB
C - CONFIRMED BY MASS SPECTRAL DATA

[illegible]

SITE NAME: [illegible] CENTER
CASE NUMBER 8[illegible]B10 PAGE 2 OF 2
CONCENTRATIONS IN PARTS PER BILLION

ORGANIC TRAFFIC NUMBERS
AND SAMPLE STATION LOCATION DESCRIPTIONS

			5
			STATION #19 BETHANY WELL #225
		MATRIX	WATER
COMPOUND	CAS#/SCAN	CLASS	
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	ABN/1	8
UNKNOWN	1345	ABN/T	

1. PRIORITY POLLUTANT
2. SPECIFIED HAZARDOUS SUBSTANCE
T TENTATIVELY IDENTIFIED

VOA - VOLATILE
ABN - ACID/BASE NEUTRAL
PES - PESTICIDE

B - THE ANALYTE IS FOUND IN THE LAB BLANK
J - INDICATES AN ESTIMATED VALUE FOR TENTATIVELY IDENTIFIED COMPOUNDS OR COMPOUNDS FOUND BELOW CONTRACT DETECTION LIMIT
P - PRESENT IN SAMPLE, BUT NOT REPORTED BY LAB
C - CONFIRMED BY MASS SPECTRAL DATA

OKD987Ø7ØØ59

51 References

PART 4

REFERENCE 9

1309 Main Street, Suite 900
Dallas, Texas
75201-4809

214/744-1641

ICF TECHNOLOGY INCORPORATED

MEMORANDUM

TO: David Wineman, Region VI, RPO

THRU: K.H. Malone Jr., FITOM

THRU: Tim Hall, ICF-AFITOM

FROM: Ravinder Joseph, and Heather Schijf, ICF-FIT HS

DATE: October 24, 1988

SUBJECT: Resampling of municipal drinking water wells located near the Air Center Inc. site, in Oklahoma City, OK
TDD # F-6-8808-36,
CERCLIS # OKD980750319,
PAN # FOK0270SCF.

The Air Center Inc. site is an inactive, abandoned aircraft renovation and paint stripping facility, that ceased operations in March of 1984. Waste generated from the stripping process was allowed to discharge into an unlined lagoon that drained into a drainage ditch, which in turn flowed into a residential pond. Also present on site are two underground storage tanks which were used to hold stripped paint sludge. At closure the unlined lagoon was filled in and the underground storage tanks pumped dry. Currently, the site is leased by Commander Aircraft, a subsidiary of the Gulfstream Aerospace Corporation. The buildings are utilized as paint hangers by Commander Aircraft. According to Wiley Post authorities, Commander Aircraft has been asked not to use any "corrosive" paints and to discharge wastewater only to the sanitary sewers of Oklahoma City. This is to be done only after obtaining a permit from the city.

Past sediment sampling by the Oklahoma Water Resources Board and by the Oklahoma Department of Health indicated elevated levels (above background) of cyanide, lead, chromium, phenol and zinc. Furthermore, sampling by the EPA-FIT in January of 1988 indicated the presence of phenol, and cyanide, in both on-site and off-site soil and water samples, and elevated levels of lead in the City of Bethany drinking water wells. The results indicated 176 ppb of lead in well #21 and 66 ppb of lead in well # 23.

On August 22, 1988, FIT team members, Ravinder Joseph (team leader), and Tom Rountree (site safety officer) resampled City of Bethany municipal drinking water wells # 21 and # 23. Well # 21 is located approximately 1.4 miles southwest of the site, and well # 23 is located approximately 3000 feet west of the site. A copy of the USGS topographic map and sample location map are attached. The August, 1988 samples were analyzed for lead only. This resampling was due to the detection of lead in samples collected in January of 1988. Both samples were collected from taps or openings directly on the well head (see photographs # 4 and # 5). Table 1 indicates field measurements, collection times, and amount of lead detected in samples. Sample 4 is a trip blank using deionized water. Samples 1 and 4 were collected directly into the sample bottles. Samples 2 and 3 were collected in a glass beaker, and then poured into the sample bottles. All four samples were shipped to the EPA Houston lab on August 22, 1988, via Federal Express. Attached are copies of the chain of custody and receipt for samples.

Table 1

Sample #	Well #	Collection Time	Field Measurements pH	Cond.	Temp.	Lead in ppb
1	21	1250 - 1255 hrs	7.57	465 umhos	26°C	7.6
2	23	1345 - 1350 hrs	6.3	250 umhos	25°C	< 5
3	24 (dup of 23)	1350 - 1355 hrs	6.3	250 umhos	25°C	< 5
4	Trip Blank	1220 - 1225 hrs	-	-	-	< 5

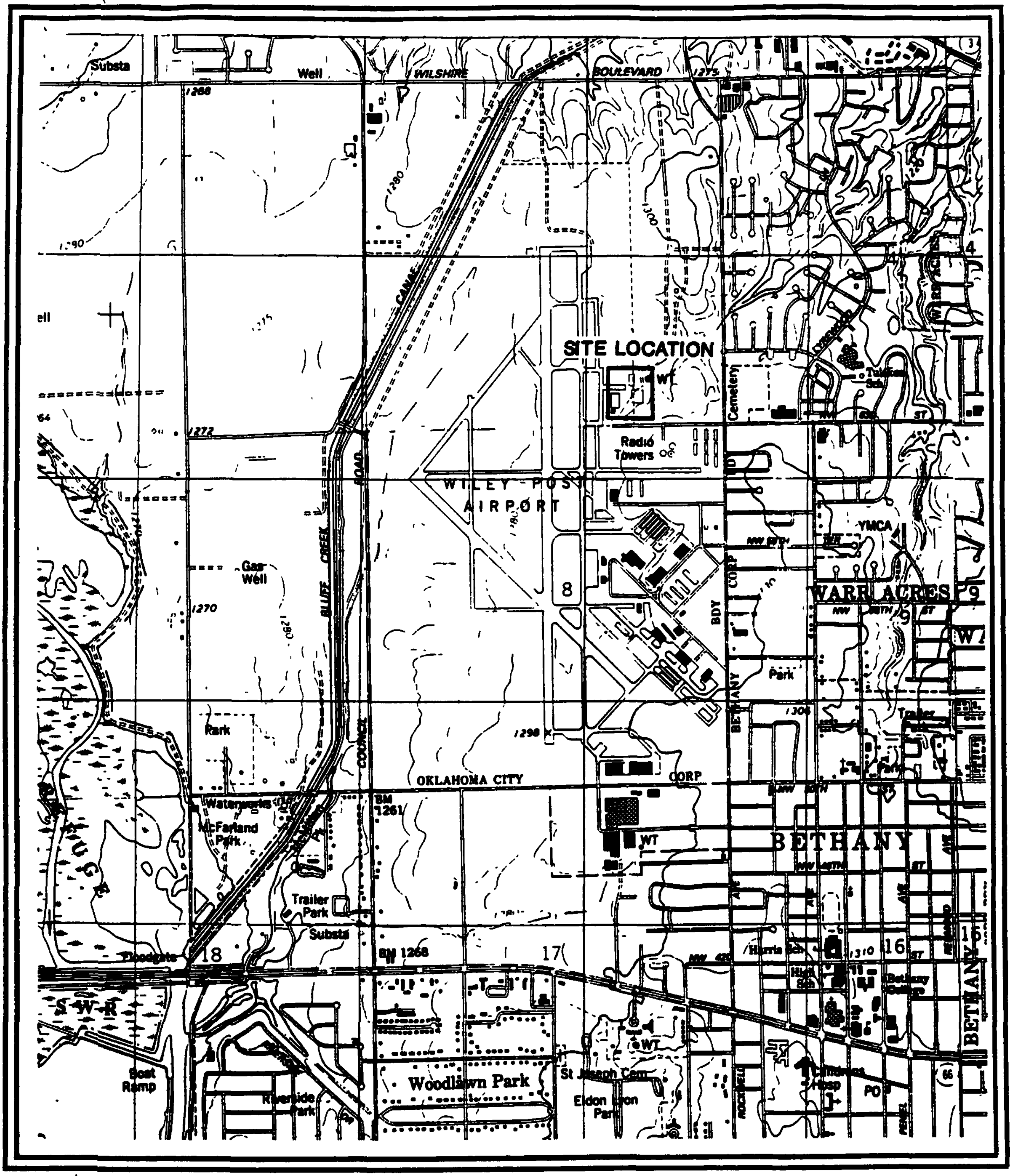
Analysis of the August 1988 samples indicates the presence of low levels of lead in well # 21. Lead was not detected in well # 23. The levels detected in well # 21 are well below the current Primary Drinking Water Standard of 50 ppb, and would still fall below the proposed standard of 20 ppb (see Attachment A for complete sample results). Although lead has been detected in on-site samples in the past, lead was not present in on-site samples collected by the FIT in January of 1988.

In response to TDD # F-6-8808-35, during the August 22, 1988 trip, FIT collected information in an attempt to determine additional potential contributors of lead contamination. Information was collected through drive bys of local industry and through the contacting of a state official. The attached map, titled Neighboring Industries, indicates their location and proximity to Air Center. FIT conducted off-site reconnaissance inspections of Gulfstream Aerospace Inc, the Wiley Post Airport, and Starlight Recoveries, all located nearby the Air Center site. FIT did not observe any noticeable problems from off-site which could contribute to surface migration of contaminants. Off-site photographs of the Wiley Post tank battery and Gulfstream are attached. Additional information regarding the operations of Starlight Recoveries was not obtained.

While observing from offsite, FIT saw what appeared to be a underground storage tank battery used for the storage of jet fuel. Information obtained from the Wiley Post authorities confirmed the presence of underground storage tanks. The Wiley Post Airport has a total of 17 underground storage tanks on-site for storing jet fuel. The total combined capacities of these tanks is estimated to be 228,000 gallons. The tanks are between 2-28 years old. It is not known whether any of these tanks have been leak tested. The potential exists for Wiley Post Airport to contribute to the lead contamination of groundwater as lead is a constituent of jet fuel.

FIT also contacted Tom Black with the Oklahoma Water Resources Board to obtain the following additional information on Gulfstream Aerospace Corporation (see Attachment B for file information obtained from Mr. Black). Gulfstream is a manufacturer of aircraft parts and is located at 5001 North Rockwell, Bethany, OK 73008. It is a generator of chromic acid, jet fuel and dried paint waste containing zinc chromate and solvents. Lead contaminated foundry sand was found dumped on-site during sampling by OSDH in May 1986. Spills of chromic acid and hydrofluoric acid were also reported in May 1986. Sampling by OSDH in May 1986, detected lead concentrations as high as 4850 ppm and chromium as high as 1281 ppm in soil samples. In addition, there are seven underground storage tanks at Gulfstream containing unleaded gas, diesel, and jet fuel. The tanks have a combined total capacity of 48,000 gallons. The tanks are between 15-26 years old. It is not known if any of these tanks have been leak tested, as it was only recently that the Oklahoma Corporation Commissions UST Department required test results to be submitted as part of the reporting requirement for underground storage tanks. The potential exists for Gulfstream to contribute to the lead and chromium contamination.

While it is unclear if Air Center is contributing to groundwater contamination, past sampling has indicated that Air Center has contributed to surface water contamination. It is recommended that the surface water route be further investigated. Furthermore, it is recommended that Gulfstream Aerospace, the Wiley Post Airport and Starlight Recoveries be investigated as possible sources of lead contamination to groundwater. Sampling of all 27 City of Bethany wells would assist in defining the plume and source of contamination accurately.



N

0 2000

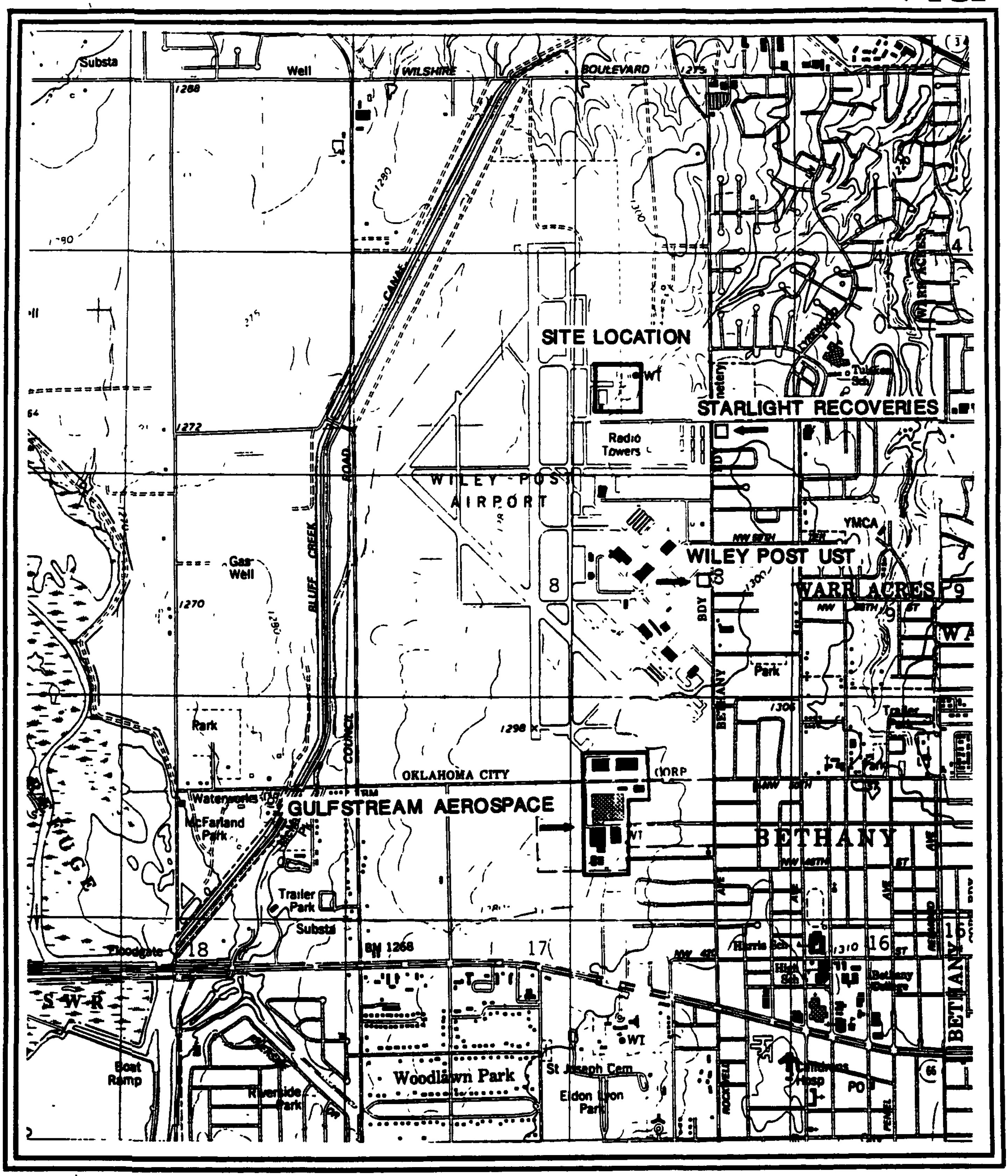
SCALE 1:24000

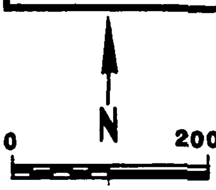
Site Location Map
AIR CENTER INC.
OKLAHOMA CITY, OK
TDD NO. F-6-8808-36
CERCLIS NO. OKD980750319

QUADRANGLE LOCATION

BETHANY, OK BRITTON, OK

ICF





N

0 2000

SCALE 1:24000

Neighboring Industries to Air Center, Inc.

AIR CENTER INC.

OKLAHOMA CITY, OK

TDD NO. F-6-8808-36

CERCLIS NO. OKD980750319

QUADRANGLE LOCATION

BETHANY, OK BRITTON, OK

SPECIAL ANALYSIS SUMMARY

SITE NAME AND NUMBER: AIR CENTER
CASE NUMBER: 8TFAFB29 PAGE 1 OF 1
CONCENTRATIONS IN PARTS PER BILLION

TRAFFIC REPORT NUMBER AND STATION LOCATION.

		01	02	03	04	
		01	02	03	04	
		01 BETHANY MUNICIPAL WELL #21	02 BETHANY MUNICIPAL WELL #23	03 BETHANY MUNICIPAL WELL #24	04 TRIP BLANK	
	MATRIX	WATER	WATER	WATER	WATER	
	% MOISTURE	0	0	0	0	0
	CAS NO.					
LEAD	7439-92-1	7.600	5U	5U	5U	0

R - DATA IS UNUSABLE DUE TO QA/QC OUT OF CONTROL LIMITS.
J - REPORTED CONCENTRATIONS OR DETECTION LIMITS ARE ESTIMATES DUE TO QA/QC OUT OF CONTROL.
B - CONCENTRATION IN SAMPLE ATTRIBUTABLE TO BLANK CONTAMINATION.
U - NOT DETECTED; VALUE REPORTED IS THE DETECTION LIMIT.

REFERENCE 10

TO: FILE

FROM: Kevin Jaynes

SUBJ: Continuing Research Investigation and File Check of Wiley Post Airport, Bethany, Oklahoma (CERCLIS No. OKD0987070059).

DATE: May 10, 1991

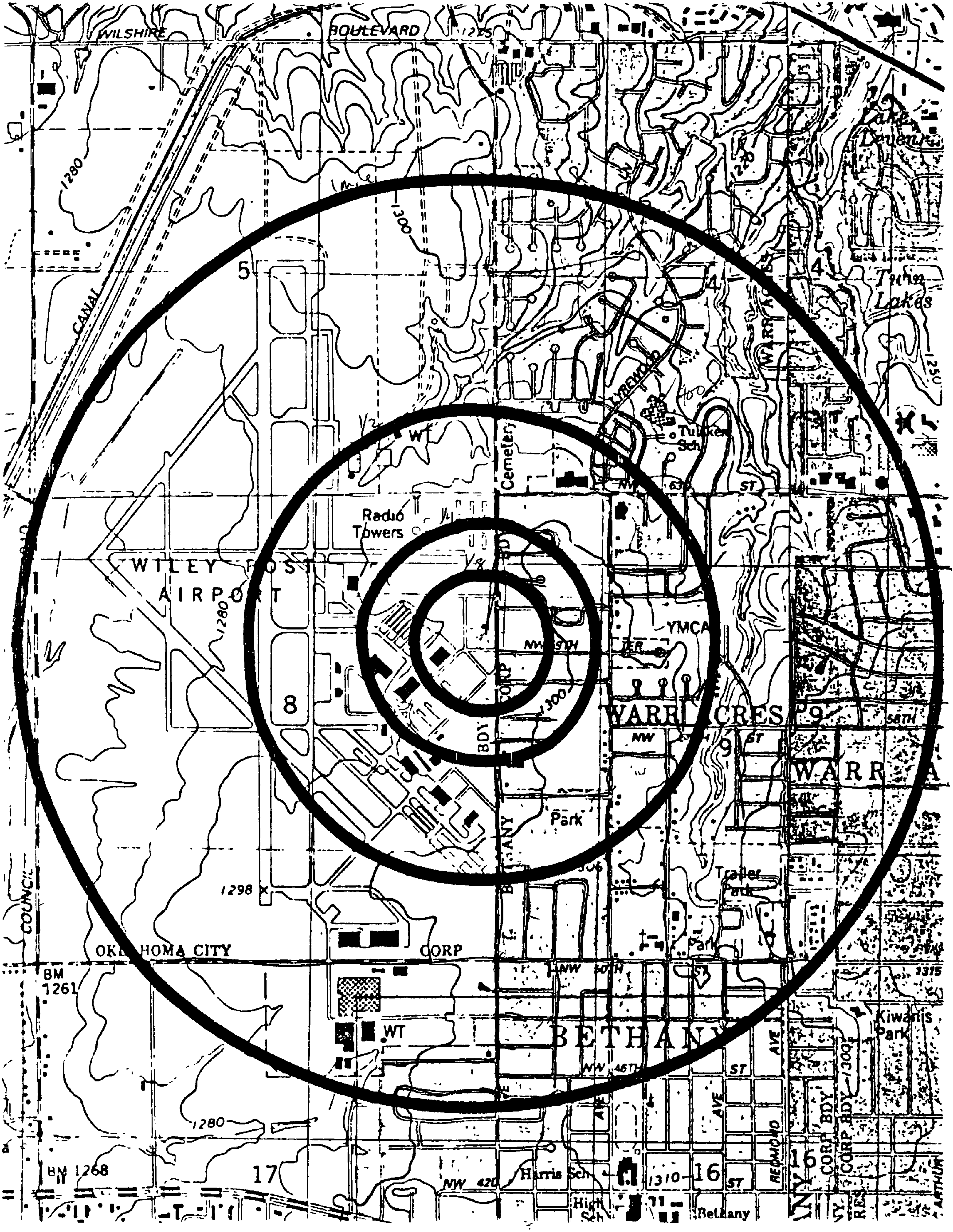
The FIT met with representatives of Wiley Post Airport and the Oklahoma Airport Planning and Development Corporation in Oklahoma City to discuss the closure of nine USTs located near hangar facilities at Wiley Post Airport (WPA). WPA is located at N.W. 50th and Rockwell. The FIT met with Lou Dominquez of the Planning and Development Corporation, Wayne Fuller, General Manager of WPA, Dan Spitz, Hydrogeologist, TECHRAD Environmental Services, Inc. and Steve Schuller who is charge of maintenance of the Main Fuel Storage Facility at WPA.

Dan Spitz supplied the FIT with documentation and analytical data on three separate UST closure activities near hangar facilities and one closure that had been completed in the Main Fuel Storage Facility. The pulls were initiated in 1989 because of age, liability and they were no longer needed.

Steve Schuller indicated to the FIT that existing USTs in the Main Fuel Storage Facility are visually inspected annually and if a tank appears suspicious it is considered dead. The tank is then mill tested and the epoxy liners are checked for leaks. Mr. Schuller continued stating that WPA operates under the Federal Aviation Administration Code 139 for commercial airports fuel storage. WPA is not required to do this since no commercial or charter air service is offered.

Mr. Fuller indicated that Guernsey Co. did the oversee contractual work for airport renovations and that TECHRAD was brought in to check the integrity of all remaining USTs and consult in closures.

The FIT then conducted a house count within 1 mile of the WPA Main Fuel Storage Facility. Results from the house count indicate that there were approximately 2,400 homes not including three large 100+ unit apartment complexes.



WILSHIRE
BOULEVARD
CANAL
1280
1300
5
4
Twin Lakes
1250
LYREWOOD
Tulakes Sch
Cemetery
NW 63D ST
WT
Radio Towers
WILEY POST AIRPORT
YMCA
NW 59TH TER
8
BDY CORP
BETHANY
WARR ACRES
9
NW 58TH ST
Park
Trailer Park
1298
OKLAHOMA CITY CORP
COUNCIL
BM 1261
NW 50TH ST
1315
BETHANY
Kiwanis Park
NW 46TH ST
REDMOND
AVE
1280
BM 1268
17
NW 42D
Harris Sch
1310
16
High Sch
Bethany

REFERENCE 11

RECORD OF COMMUNICATION

Reference 11

TYPE: Telephone Call **DATE:** 5-21-91 **TIME:** 2:30 p.m.

TO: Kevin Jaynes
FIT Biologist
ICF Technology, Inc.
Dallas, Texas
214-744-1641

FROM: Jim Smith
Construction Manager
Aklahoma Airport Planning
and Development Corporation
Oklahoma City, Oklahoma
405-681-5311

SUBJECT: Wiley Post Airport, Location of Triton Air, Hangar 6 USTsf and Remedial Activity at Hangar 4.

SUMMARY OF COMMUNICATION

Mr. Smith returned my call. Mr. Smith indicated that from talking with Wayne Fuller that the UST at Hangar 6 was still in ground and plans are being made to pull it.

Mr. Smith indicated that Triton Air is at Hangar 14. Mr. Smith is assuming that when Hangar 14 was built that these tanks were removed. He is not for sure because Mr. Smith has only been with the Airport Planning Board for seven years.

The ground water impact at Hangar 4 has not been remediated. The excavation in 1989 was open a month or two then backfilled.

REFERENCE 12

RECORD OF COMMUNICATION

Reference 12

TYPE: Discussion **DATE:** 5-16-91 **TIME:** 1:30 p.m.

TO: Kevin Jaynes FIT Biologist ICF Technology, Inc. Dallas, Texas 214-744-1641	**FROM:** Ed Sierra Regional Project Officer EPA Region VI Dallas, Texas 214-655-6491

SUBJECT: CERCLA Jurisdiction Over the USTs at Wiley Post Airport.

SUMMARY OF COMMUNICATION

Ed Sierra and Kevin Jaynes discussed the USTs at Wiley Post Airport. The report by WPA and TECHRAD that two 550 gallon waste oil tanks had leaked and that ground water contamination was evident was discussed.

After reviewing 40 CFR 260 it was determined that the reported waste oils were not considered as CERCLA hazardous wastes and the matter should be referred to the Underground Storage Tank Division of EPA Region VI. Sierra suggested finishing a closure report explaining the USTs and areas of concern in relation to targets. Also suggested contacting Barbara Driscoll and see if a prescore should be done.

REFERENCE 13

RECORD OF COMMUNICATION

Reference 13

TYPE: Telephone Call **DATE:** 12-14-90 **TIME:** 10:59 a.m.

TO:		**FROM:**	
	Barbara Driscoll		Don Hudnall, Jr. KJ for DH
	Project Officer		FIT Toxicologist
	EPA Region VI		ICF Technology, Inc.
	Dallas, Texas		Dallas, Texas
	214-655-6740		214-744-1641

SUBJECT: Wiley Post Update

SUMMARY OF COMMUNICATION

Upon communication with Barbara Driscoll, I informed her that sampling results for the UST pulls were being sent to me. I also informed her that many of the tank areas were currently covered with concrete. Overall the site appeared clean. Driscoll requested completing a workplan but do not include sampling.

REFERENCE 14

F-6-8707-11

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

REGION: 6

SITE NUMBER (to be assigned by Hq): OKD980750319

GENERAL INSTRUCTIONS: Complete Sections I and III through XV of this form as completely as possible. Then use the information on this form to develop a Tentative Disposition (*Section II*). File this form in its entirety in the regional Hazardous Waste Log File. Be sure to include all appropriate Supplemental Reports in the file. Submit a copy of the forms to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Tack Force (*EN-335*); 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME: Air Center, Inc.

B. STREET (or other identifier): Hwy. 8, Wiley Post Airport, 7300 N.W. 63rd

C. CITY: Oklahoma City

D. STATE: OK

E. ZIP CODE: 73131

F. COUNTY NAME: Oklahoma

G. SITE OPERATOR INFORMATION

1. NAME: Mr. Lou Dominguez, Mgr. Airport Planning and Development
2. TELEPHONE NUMBER: (405) 681-5311
3. STREET: P.O. Box 5993
4. CITY: Oklahoma City
5. STATE: OK
6. ZIP CODE: 73159

H. REALTY OWNER INFORMATION (if different from operator of site)

1. NAME: City of Oklahoma City
2. TELEPHONE NUMBER: (405) 231-2011
3. CITY: Oklahoma City
4. STATE: OK
5. ZIP CODE: 73102

I. SITE DESCRIPTION: Former aircraft renovation and paint stripping facility

J. TYPE OF OWNERSHIP

☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☒ 4. MUNICIPAL ☐ 5. PRIVATE

II. TENTATIVE DISPOSITION (complete this section last)

A. ESTIMATE DATE OF TENTATIVE DISPOSITION (mo., day, & yr.):

B. APPARENT SERIOUSNESS OF PROBLEM

☐ 1. HIGH ☒ 2. MEDIUM ☐ 3. LOW ☐ 4. NONE

C. PREPARER INFORMATION

1. NAME: Ravinder Joseph, ICF Technology/FIT
2. TELEPHONE NUMBER: (214) 744-1641
3. DATE (mo., day, & yr.): July 29, 1987

III. INSPECTION INFORMATION

A. PRINCIPAL INSPECTOR INFORMATION

1. NAME: Debra Pandak
2. TITLE: FIT Environmental Scientist
3. ORGANIZATION: ICF Technology, 1509 Main Street, Suite 900, Dallas, Texas 75201
4. TELEPHONE NO. (area code & no.): (214) 744-1641

B. INSPECTION PARTICIPANTS

1. NAME	2. ORGANIZATION	3. TELEPHONE NO.
Ravinder Joseph	ICF Technology, Dallas	(214) 744-1641
Heather Schijf	ICF Technology, Dallas	(214) 744-1641
Tom Rountree	ICF Technology, Dallas	(214) 744-1641

C. SITE REPRESENTATIVES INTERVIEWED (corporate officials, workers, residents)

1. NAME	2. TITLE & TELEPHONE NO.	3. ADDRESS
Scott A. Thompson	Environmental Specialist (405) 271-2702	Oklahoma State Dept. of Health, P.O. Box 53551, 1000 N.E. Tenth, Oklahoma City, OK 73152
John N. Ice	Environmental Health Spec. (405) 271-7063	Oklahoma State Department of Health, Industrial Waste Division

Continued From Page 2

IV. SAMPLING INFORMATION *(continued)*

C. PHOTOS

1. TYPE OF PHOTOS	2. PHOTOS IN CUSTODY OF
[X] a. GROUND [ ] b. AERIAL	EPA Region 6 (see attached)

D. SITE MAPPED?

[X] YES. SPECIFY LOCATION OF MAPS: Location map and site sketch attached

E. COORDINATES

1. LATITUDE *(deg.-min.-sec.)*	2. LONGITUDE *(deg.-min.-sec.)*
35° 32' 17" N	97° 38' 30" W

V. SITE INFORMATION

A. SITE STATUS

[ ] 1. ACTIVE *(Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)*	[X] 2. INACTIVE *(Those sites which no longer receive wastes.)*	[ ] 3. OTHER *(specify)*: *(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)*

B. IS GENERATOR ON SITE?

[ ] 1. NO [X] 2. YES *(specify generator's four-digit SIC Code)*: 3724

C. AREA OF SITE *(in acres)*	D. ARE THERE BUILDINGS ON THE SITE?
11.5 (estimated)	[ ] 1. NO [X] 2. YES *(specify)*: There are three hangers, an above ground water tank and a shed adjoining the tank

VI. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

X'	A. TRANSPORTER	X'	B. STORER	X'	C. TREATER	X'	D. DISPOSER
	1. RAIL		1. PILE		1. FILTRATION		1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE	X	5. TANK, BELOW GROUND		5. CHEM./PHYS./TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER *(specify)*:		6. OTHER *(specify)*: Tank covers discovered on site (photos 19 and 20) point to the presence of underground storage tanks. (See attached ROC to Wayne O'Berg.)		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY	X	8. OTHER *(specify)*: A lagoon which has since been filled up is presumed to be on site. Drainage ditch.
					9. OTHER *(specify)*:		

E. SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this form.

[X] 1. STORAGE [ ] 2. INCINERATION [ ] 3. LANDFILL [ ] 4. SURFACE IMPOUNDMENT [ ] 5. DEEP WELL

[ ] 6. CHEM/BIO/PHYS TREATMENT [ ] 7. LANDFARM [ ] 8. OPEN DUMP [ ] 9. TRANSPORTER [ ] 10. RECYCLOR/RECLAIMER

VII. WASTE RELATED INFORMATION

A. WASTE TYPE

[X] 1. LIQUID [ ] 2. SOLID [X] 3. SLUDGE [ ] 4. GAS

B. WASTE CHARACTERISTICS

[ ] 1. CORROSIVE [ ] 2. IGNITABLE [ ] 3. RADIOACTIVE [ ] 4. HIGHLY VOLATILE

[X] 5. TOXIC [ ] 6. REACTIVE [ ] 7. INERT [ ] 8. FLAMMABLE

[ ] 9. OTHER *(specify)*:

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

No

Continued From Page 4

VIII. HAZARD DESCRIPTION *(continued)*

☐ B. NON-WORKER INJURY/EXPOSURE

☐ C. WORKER INJURY/EXPOSURE

☐ D. CONTAMINATION OF WATER SUPPLY

☒ E. CONTAMINATION OF FOOD CHAIN

Possible contamination of fish in Woodlake pond. Recon team documented fishing in this pond (photo #11). There had been a complaint of bad tasting fish from a resident some years back.

☐ F. CONTAMINATION OF GROUND WATER

☒ G. CONTAMINATION OF SURFACE WATER

The Oklahoma State Department of Health found significant concentrations of heavy metals (lead and chromium) in the sediments of Woodlake pond and along the drainage path leading to the pond. No visual evidence of this was observed during the FIT recon.

3

Continued From Page 6

VIII. HAZARD DESCRIPTION *(continued)*

☐ N. FIRE OR EXPLOSION

☐ O. SPILLS/LEAKING CONTAINERS/RUNOFF/STANDING LIQUID

☐ P. SEWER, STORM DRAIN PROBLEMS

☐ Q. EROSION PROBLEMS

[XX] R. INADEQUATE SECURITY

Air Centre has been out of business since March 1984. The facility is on airport property, which is completely fenced. The site has a locked gate in fron approximately five feet tall. Employees of the airport could access the property easily.

☐ S. INCOMPATIBLE WASTES

4

Continued From Page 8

X. WATER AND HYDROLOGICAL DATA (continued)

LIST ALL DRINKING WATER WELLS WITHIN A 1/4 MILE RADIUS OF SITE

1. WELL	2. DEPTH (specify unit)	3. LOCATION (proximity to population/buildings)	4. NON-COMMUNITY (mark 'X')	5. COMMUNITY (mark 'X')
		See Attachment A		

RECEIVING WATER

1. NAME: Woodlake Pond

☐ 2. SEWERS ☐ 3. STREAMS/RIVERS
☒ 4. LAKES/RESERVOIRS ☐ 5. OTHER (specify)

6. SPECIFY USE AND CLASSIFICATION OF RECEIVING WATERS

Woodlake Pond is used mainly for recreational use and for fishing. Drainage path leads from this into a series of lakes across Bluff Creek Canal and possibly into Silver Lake and Ski Island, also used for recreational purposes.

XI. SOIL AND VEGITATION DATA

LOCATION OF SITE IS IN

☐ A. KNOWN FAULT ZONE ☐ B. KARST ZONE ☐ C. 100 YEAR FLOOD PLAIN ☐ D. WETLAND
☐ E. A REGULATED FLOODWAY ☐ F. CRITICAL HABITAT ☒ G. RECHARGE ZONE OR SOLE SOURCE AQUIFER

XII. TYPE OF GEOLOGICAL MATERIAL OBSERVED

Mark 'X' to indicate the type(s) of geological material observed and specify where necessary, the component parts.

'X'	A. OVERBURDEN	'X'	B. BEDROCK (specify below)	'X'	C. OTHER (specify below)
x	1. SAND	x	Red shale, sandstone	x	unconsolidated interfringering lenses of sand, silt, gravel and clay
x	2. CLAY				
	3. GRAVEL				

XIII. SOIL PERMEABILITY

☐ A. UNKNOWN ☐ B. VERY HIGH (100,000 to 1000 cm/sec.) ☐ C. HIGH (1000 to 10 cm/sec.)
☐ D. MODERATE (10 to .1 cm/sec.) ☒ E. LOW (.1 to .001 cm/sec.) ☒ F. VERY LOW (.001 to .00001 cm/sec.)

G. RECHARGE AREA

☒ 1. YES ☐ 2. NO 3. COMMENTS: Possible recharge of alluvium and bedrock aquifers

H. DISCHARGE AREA

☐ 1. YES ☒ 2. NO 3. COMMENTS:

I. SLOPE

1. ESTIMATE % OF SLOPE: 1-3%

2. SPECIFY DIRECTION OF SLOPE, CONDITION OF SLOPE, ETC.: East and Northeast

J. OTHER GEOLOGICAL DATA

5

(1)

RECORD OF COMMUNICATION

[x] Phone Call [ ] Discussion [ ] Field Trip
[ ] Conference [ ] Other(Specify)

(405) 787-2463

(Record of Item Checked Above)

TO:	FROM:	DATE
Wayne O'Berg Former Director of Operations for Air Center, Inc. Oklahoma City	Heather Schijf, ICF Technology	9/8/87 TIME 8:30 a.m.

SUBJECT

Location of Storage Tanks on Air Center Property

SUMMARY OF COMMUNICATION

There were two 500-gallon storage tanks located on the property at the time of the closure of the Air Center, Inc. in 1985. The tanks are located along the outside of the east well of the northend of hanger 8B. The storage tanks came out from the building (in an easterly direction) for approximately 15 to 20 feet. The depth of the tanks is approximately six to eight feet. The tanks were used to hold stripped sludge, and when full the sludge was pumped into a pumper truck and transported to a disposer in Kansas City. The waste was manifested. At closure, the tanks were pumped and empty. The airport repumped the tanks again. To his knowledge, the tanks are empty of stripper sludge.

Two drainage ditches with a series of screens (sumps) were located in the floor of hanger 8B. The stripped material would come off the planes and go into the drainage ditch, then the settled solids would go into the holding tanks and the liquid (mainly water) would leave the building through a concrete drainage pipe. The liquid would be held in three holding ponds. The ponds worked on an overflow method. When the first one was full, it would overflow into the next pond located just below it (it was terraced). The second pond was located in the trees. By the time the liquid reached the third pond, the liquid was clear and aquatic life was present. The liquid was treated naturally - no chemicals were used. The settling ponds were unlined. The first pond was approximately 100 feet by 100 feet. The State Health Department did sampling in 1984 and gave the Air Center a clean bill of health. In 1984, the State Health Department came in on a report that the Air Center was discharging phenols. According to Mr. O'Berg, the Air Center did not use phenols. They used a brand called Elderado. At one time, they were using a stripper with low levels of chromium but switched and used a stripper with no chromium. The sampling by the State went on for approximately four months and a clean bill of health was given. / Heather Schijf 9-8-87

INFORMATION COPIES TO:

EPA Form 1300-6 (7-72)
Replaces EPA HQ Form 5300-3 Which May Be Used Until Supply Is Exhausted

6

STORAGE FACILITIES SITE INSPECTION REPORT
(Supplemental Report)

INSTRUCTION
Answer and Explain as Necessary.

STORAGE AREA HAS CONTINUOUS IMPERVIOUS BASE
☐ YES ☐ NO Unknown

STORAGE AREA HAS A CONFINEMENT STRUCTURE
☐ YES ☐ NO Unknown

EVIDENCE OF LEAKAGE/OVERFLOW *(If "Yes", document where and how much runoff is overflowing or leaking from containment)*
☐ YES ☐ NO Unknown

ESTIMATE TYPE AND NUMBER OF BARRELS/CONTAINERS

None

GLASS OR PLASTIC STORAGE CONTAINERS USED
☐ YES ☒ NO

ESTIMATE NUMBER AND CAPACITY OF STORAGE TANKS
Two NOS 500-gallon underground storage tanks according to Air Centre permit application in February 1984. Visual evidence of tanksseen in attached photos (photo #9 , photo # 20)

NOTE LABELING ON CONTAINERS

None. Tanks used to stove paint stripping sludge.

EVIDENCE OF LEAKAGE CORROSION OR BULGING OF BARRELS/CONTAINERS/STORAGE TANKS *(If "Yes", document evidence. Describe location and extent of damage. Take PHOTOGRAPHS)*
☐ YES ☐ NO
Unknown

DIRECT VENTING OF STORAGE TANKS
☐ YES ☒ NO

. CONTAINERS HOLDING INCOMPATIBLE SUBSTANCES *(If "Yes", document evidence. Describe location and identity of hazardous waste. Take PHOTOGRAPHS.)*
☐ YES ☐ NO Unknown

1. INCOMPATIBLE SUBSTANCES STORED IN CLOSE PROXIMITY *(If "Yes", document evidence. Describe location and identity of hazardous waste. Take PHOTOGRAPHS.)*
☐ YES ☐ NO Unknown

2. ADEQUATE CONTAINER WASHING AND REUSE PRACTICES
☐ YES ☒ NO

3. ADEQUATE PRACTICES FOR DISPOSAL OF EMPTY STORAGE CONTAINERS
☐ YES ☒ NO

7

REFERENCE 16

RECORD OF COMMUNICATION

Reference 16

TYPE: Telephone Call **DATE:** 5-15-91 **TIME:** 11:20 PM

TO: David Pruitt
Oklahoma Department
of Health
405-271-7159

FROM: Kevin Jaynes
FIT Biologist
ICF Technology, Inc.
Dallas, Texas
214-744-1641

SUBJECT: Oklahoma Department of Health Involvement with Wiley Post UST Pulls

SUMMARY OF COMMUNICATION

The ODH was involved with the 3,000 and 8,000 gallon tank pulls.

ODH says that they were closed properly and all samples as directed by ODH came clean.

ODH indicates clean closure on these tanks and a written closure will follow. The Oklahoma Corporation commission gave closures on the previous pulls. ODH will look at the other OCC closures.

REFERENCE 17

RECORD OF COMMUNICATION

Reference 17

TYPE: Telephone Call **DATE:** 5-17-91 **TIME:** 4:00 p.m.

TO: Kevin Jaynes Kj
FIT Biologist
ICF Technology, Inc.
Dallas, Texas
214-744-1641

FROM: Tana Walker
Oklahoma Corporation
Commission
UST Division
Oklahoma City, Oklahoma
405-521-2211

SUBJECT: Wiley Post Airport USTs and OCC Jurisdiction.

SUMMARY OF COMMUNICATION

Ms. Walker returned my call. I asked her about the removals at WPA and specifically the November 1989 removal where there were two tanks that leaked into the groundwater at Hangar 4. Ms. Walker explained that the Oklahoma Department of Health handled all city and municipal UST affairs. The OCC did have a record of the incident and turned the matter over to the Oklahoma Water Resources Board. Contact Phyllis Robertson at 405-231-2510 or 2513. The Case No. is 064-BX.

Ms. Walker indicated that in incidents where contamination is evident the matter is turned over to ODH or OWRB.

Ms. Walker explained that as far as a verbal closure approval, that would have been given through the overseeing engineer from the OCC who is Tom Springer.

REFERENCE 18

OKLAHOMA
GEOLOGICAL
SURVEY

CIRCULAR 71

Ground-Water Resources
Cleveland and Oklahoma Counties

P. R. WOOD

and

L. C. BURTON

1968

OKLAHOMA GEOLOGICAL SURVEY

CHARLES J. MANKIN, *Director*

CIRCULAR 71

Ground-Water Resources in Cleveland and Oklahoma Counties, Oklahoma

P. R. WOOD AND L. C. BURTON
U. S. Geological Survey

Prepared under a cooperative agreement between
Oklahoma Geological Survey and U. S. Geological Survey

The University of Oklahoma

Norman

1968

Ground-Water Resources in Cleveland and Oklahoma Counties, Oklahoma

P. R. WOOD AND L. C. BURTON

ABSTRACT

Cleveland and Oklahoma Counties, in central Oklahoma, have a combined area of 1,252 square miles and a range in altitude of from 870 to 1,400 feet above sea level. The annual precipitation is about 33 inches at Norman and about 32 inches at Oklahoma City. In 1960 the two counties had a population of 487,000, of which 95 percent lived in the Norman and Oklahoma City urban areas and 5 percent lived in small towns and rural areas. General farming and livestock breeding are the predominant types of agriculture. Industry is widely diversified and is expanding rapidly.

Rocks exposed at the surface are Permian and Quaternary in age. The Permian rocks include the Wellington Formation, Garber Sandstone, Hennessey Shale, Duncan Sandstone, and Chickasha Formation. The Quaternary rocks include terrace deposits at one or more levels along the valleys of the principal streams, alluvium, and dune sand.

The terrace deposits and alluvium supply ground water for domestic and stock use at many places in the two counties. The alluvial deposits along the North Canadian River at Oklahoma City are capable of yielding 200 or more gallons of water per minute to properly developed wells. The Chickasha Formation, Duncan Sandstone, and Hennessey Shale yield small quantities of hard water to wells. In places, water from wells 100 or more feet deep is too highly mineralized for most uses.

The principal sources of ground water used for municipal and industrial purposes are the Garber Sandstone and the Wellington Formation. The two formations were deposited under similar conditions, and both consist of lenticular beds of sandstone alternating with shale. Beds may vary greatly in thickness within short lateral distances.

At variable depths below the land surface the Garber and Wellington contain water too highly mineralized for most uses. Hence, the depth to which wells may be drilled in search of potable water supplies is largely determined by the depth at which salt water is encountered. In southeastern Cleveland County salt water occurs about 100 feet below land surface. In eastern Cleveland and Oklahoma Counties salt water occurs at depths ranging from 200 to 660 feet below land surface. In the Oklahoma City, Lake Hefner, and Edmond areas salt water is 700 to 800 feet below land surface; in the Midwest City area, more than 1,000 feet; at Norman, 700 feet; and at Noble, 400 feet.

GEOLOGY

The rocks exposed in Cleveland and Oklahoma Counties include consolidated sedimentary rocks (redbeds) of Permian age, and unconsolidated terrace deposits and alluvium of Quaternary age. Their lithologic character and water-bearing properties are summarized in table 2. Gravel, clay, and gravelly clay deposits older than those beneath the terraces cap some of the higher hills in the eastern part of the area. At some places, deposits ranging from 1 to 10 feet in thickness have been quarried for use in surfacing roads. These deposits are thin, cover limited areas in widely separated places, and are not a source of ground water. Hence, although of academic interest to the geologist and geomorphologist, the gravel deposits were not mapped and will not be discussed further in this report. Pennsylvanian and older rocks occur beneath the Permian rocks, and some of the older rocks contain petroleum and natural gas of considerable economic importance. However, all those rocks contain water too salty for domestic, municipal, and most industrial uses, and for this reason they are not discussed in this report.

Permian Rocks

The oldest rocks exposed in Cleveland and Oklahoma Counties are siltstones, sandstones, and shales of Permian age. The Permian rocks generally are called redbeds because they are predominantly red, although other colors, such as orange, maroon, purple, white, gray, and greenish gray, may be seen in exposures.

In ascending order, the Permian rocks exposed in Cleveland and Oklahoma Counties are: Wellington Formation, Garber Sandstone, Hennessey Shale, Duncan Sandstone, and Chickasha Formation. Miser (1954) mapped the Garber and Wellington as separate units north of the North Canadian River, but as a combined unit south of the river. Because of their lithologic similarity, the two formations constitute a single aquifer system. The upper sandy part of the Hennessey Shale has been called the Cedar Hills Sandstone Member in Canadian County and northwestward (Mogg, Schoff, and Reed, 1960; Miser, 1954; Fay, 1962; Ham, 1962; Bado and Jordan, 1962). The Cedar Hills Sandstone Member has not been recognized south of the North Canadian River. The Chickasha Formation and Duncan Sandstone were mapped separately in southeastern Canadian County by Armstrong (1958). Because of their small areal extent and unimportance as aquifers, these formations have been mapped as a single unit in this report.

The rocks of Permian age form roughly parallel outcrop patterns in the two counties (pl. I; Miser, 1954). In Oklahoma County the strike of the rocks is nearly northward, but in Cleveland County it is north-northwestward. The exposed bedrock formations become progressively younger toward the west, and their regional dip is 30 to 35 feet per mile westward and southwestward toward the trough of a large asymmetrical syncline commonly referred to as the Anadarko basin.

Although the regional structure is that of a gently westward-dipping homocline, local irregularities reflect important structures in deeply buried rocks. With respect to ground water, the more important of these irregularities are local flexures in the Garber Sandstone and Wellington Formation in the Oklahoma City and Midwest City areas. The flexures are related to and reflect the location of the structural high beneath the Oklahoma City oil field and the structural trough in the Midwest City area (Travis, 1930).

GARBER SANDSTONE AND WELLINGTON FORMATION

The Garber Sandstone and Wellington Formation crop out across the eastern two-thirds of Cleveland and Oklahoma Counties in a northward-trending belt 6 to 20 miles wide. The area of outcrop is characterized by rolling, steep-sided hills that are forested with scrub oak and other small, slow-growing deciduous trees.

The Wellington Formation is the oldest of the Permian rocks exposed in Cleveland and Oklahoma Counties. Its base is not exposed in either of the counties, and the Garber Sandstone conformably overlies or grades into it. Because of the absence of fossils and key beds and the similarities of lithology, the Garber Sandstone and Wellington Formation are not readily distinguishable in the area. The two formations have similar water-bearing characteristics and therefore have been mapped as a single unit (pl. I).

The contact of the Garber Sandstone with the overlying Hennessey has been described as "apparently conformable" (Anderson, 1927, p. 9; Travis 1930, p. 11). Generally, the contact is relatively easy to recognize because it is marked by the boundary between forested hills of the Garber and the nearly smooth, grass-covered prairies developed on the Hennessey. However, close examination suggests that the contact is gradational, at least locally. In road cuts in the northern part of Oklahoma County, sandstone layers having a lithology similar to the Garber can be observed to grade laterally into shale resembling the Hennessey. Thus, in places there may be a zone 20 or 30 feet thick in which the two formations interfinger.

The Garber and Wellington consist of lenticular beds of massive-appearing, cross-bedded sandstone irregularly interbedded with shale which is in part sandy to silty. The sandstone layers are fine to very-fine grained and loosely cemented. According to C. L. Jacobsen (written communication, 1944), none of the sand in the Garber and Wellington is coarser than 0.350 mm (millimeter), and the average diameter of the grains is 0.155 mm. The sandstone is composed almost entirely of subangular to subrounded fragments of fine-grained quartz.

Cross-bedding in the sandstone is well developed and many layers that appear to be massive are actually formed by a large number of cross-bedded units, each only a few inches thick. The cross-bedded units are typically wedge shaped, the foreset inclinations vary greatly in direction, the laminations have little upward concavity, and the foresets are relatively short. Commonly, lenticular sandstone beds terminate laterally along cross-bedded laminations. In a single exposure the inclinations of the laminae may be in several directions, and commonly they are opposed.

The sandstone is poorly cemented and it crumbles easily. The most common cement is a fine red mud, although thin discontinuous beds and irregular masses of sand have been cemented with calcite, dolomite, and barite. Sand-barite rosettes (Ham and Merritt, 1944, p. 30), fragments of fossilized wood, and small concretions and concretionary masses, composed chiefly of calcite, dolomite, barite, or hematite, have been reported from many beds. Thin discontinuous beds, layers, and stringers of dolomitic conglomerate or dolomitic sandstone occur at the base of sandstone beds in many places. Thin layers of chert conglomerate occur at the base of sandstone beds in a few places in the eastern part of the outcrop area.

In general, the sandstone content of the Garber and Wellington is greatest in northeastern Cleveland and southeastern Oklahoma Counties. In that area about 75 percent of the exposed rock is sandstone. From that area northward and southward along the strike of the beds and westward downdip, the sandstone content becomes progressively less and the proportion of shale progressively greater. Near the Canadian River in southern Cleveland County, the Garber and Wellington are about 25 percent sandstone and 75 percent shale. As the massive beds of sandstone, which are exposed in the eastern part of the area, are traced downdip and along the strike, the greatest thicknesses of sandstone occur at progressively greater depths. Individual sandstone layers range in thickness from a few inches to 50 feet or more and vary greatly in thickness in short distances. The sandstone beds range in color from nearly white to pink, orange, deep red, or purple. In many places, beds that are red or reddish brown on weathered outcrops are white or light gray in fresh exposures.

Although some sandstone beds are relatively thick, beds 5 feet or less in thickness are more common. For instance, a well drilled in 1963 for the city of Norman near SE cor. sec. 15, T. 9 N., R. 2 W., penetrated 45 sandstone beds, having an aggregate thickness of 371 feet between depths of 100 and 700 feet. These beds ranged in thickness from 1 to 30 feet, but only 4 were 20 or more feet thick, 20 ranged from 5 to 20 feet, and 21 were 5 feet or less. Shale layers ranged from 1 to 40 feet in thickness, but only 3 were more than 10 feet and 36 were 5 feet or less.

According to Jacobsen (written communication, 1944), the thickness of the Garber is about 400 feet in central Cleveland County, about 350 feet in central Oklahoma County, and about 300 feet at the north boundary line of Oklahoma County. The Wellington is about 500 feet thick in the outcrop area but attains a thickness of 700 feet in the subsurface. Therefore, the two formations as a unit have a total thickness of 800 to 1,000 feet.

The shale beds of the Garber and Wellington are nonlaminated, white to deep red, and vary greatly in thickness in short distances. In the Wellington the shale is clayey and blocky and breaks with a conchoidal fracture. In the Garber the shale commonly is silty or sandy. As previously noted, the proportion of shale increases somewhat downdip toward the west. Near the west edge of Cleveland and Oklahoma Counties the Garber and Wellington are largely shale or shale and siltstone that contains little fresh water (fig. 4).

HENNESSEY SHALE

The Hennessey Shale covers the western one-third of Cleveland and Oklahoma Counties. Its area of outcrop is characterized by relatively flat, grass-covered prairies, largely barren of trees except along the valleys of intermittent streams.

The Hennessey consists dominantly of reddish-brown shale containing layers of siltstone and fine-grained sandstone. The shales are clayey to silty, and the siltstones contain large amounts of clay. In places along the outcrop well-indurated beds of siltstone or sandstone have weathered to form low shelflike ledges.

Beds of essentially homogeneous shale range from a few inches to 10 feet or more in thickness. Much of the shale is massive; where stratification is evident, it ranges from thinly laminated to medium bedded. The massive shales weather to form polygonal fragments and break with sharp-edged conchoidal fractures. The siltstone and sandstone beds occur in well-indurated layers ranging from a few inches to about 10 feet in thickness. Some beds of both shale and siltstone have an abundance of light-gray and gray-green spots. In outcrops, white, gray, or light-green bands occur discontinuously in beds of shale and siltstone. Lenticular beds of fine-grained sandstone, ranging from less than 1 to about 15 feet in thickness, occur near the base of the formation. In outcrop areas the thicker sandstone beds form low, steep-sided, tree-covered hills similar to the hills in the outcrop area of the Garber Sandstone.

The Hennessey Shale has a total thickness of 600 to 650 feet; however, at most places in Cleveland and Oklahoma Counties the upper part of the formation has been removed by erosion. Its thickness is believed to be about 200 feet at Norman, 40 to 100 feet in the Midwest City area east of the Oklahoma City anticline, 200 to 300 feet in the Oklahoma City area, and less than 400 feet northwest of Lake Hefner.

The Hennessey Shale as an aquifer.—Because of its lithology the Hennessey Shale is poorly permeable; however, it is an aquifer that furnishes small quantities of water to rural domestic and stock wells. About 90 percent of the wells are less than 80 feet deep, and most obtain their water supplies from a zone of weathered material above the relatively unaltered shale. Below the weathered zone, water is obtained from cavities left by the removal of soluble materials and from fractures.

The water from these wells is generally satisfactory in quality for domestic use but inadequate in quantity for a windmill or for a jet pump unless operated for brief periods in conjunction with a pressure tank. A few wells have been drilled to depths of 100 to 300 feet, and produce water largely from fractures or solution cavities that are recharged by downward seepage from the saturated zone in the weathered material. The water from the deep wells generally is highly mineralized and is used only for watering stock.

According to Dennis (1954, p. 14), the weathered zone in the Hennessey is an aquifer of local importance, although of small capacity and low permeability. Wells and holes tested by him showed transmissibilities ranging from 125 to about 2,500 gpd per foot. Several of the wells tested had specific capacities of the order of 1 to 2 gpm per foot of drawdown. During dry periods, however, the yields of all wells probably would decline as saturated material in the weathered zone became partly dewatered because of evaporation, transpiration, and pumping.

CHICKASHA FORMATION AND DUNCAN SANDSTONE

Beds of sandstone, siltstone, and shale exposed on the north side of the Canadian River in the northwest corner of Cleveland County and in the southwest corner of Oklahoma County have been referred to the Chickasha Formation and Duncan Sandstone (Armstrong, 1958). Because of their small areal extent and relative unimportance as aquifers, the Chickasha Formation and Duncan Sandstone have been mapped together for this report (pl. I). The Chickasha and Duncan, which conformably overlie the Hennessey Shale, are 150 to 200 feet thick and consist of sandstone, siltstone, siltstone conglomerate, and shale. Armstrong described the sandstone as massive, cross-bedded, fine to very fine grained, and soft to well cemented. Some of the siltstone layers are highly cross-bedded and resistant to erosion so that they make small ledges or cap low hills. All beds are lenticular and the sandstone grades laterally into siltstone or shale. The sandstone beds commonly are red orange or pink orange, but locally are brown. The shale layers generally are red.

The Chickasha and Duncan are poorly permeable and have little value as an aquifer in Cleveland and Oklahoma Counties. They are tapped by only a few small-capacity wells for domestic and stock use. In general, the water is suitable for human consumption but, in some places, contains too much dissolved gypsum or is otherwise too highly mineralized even for stock use.

Quaternary Deposits

The Quaternary deposits of Cleveland and Oklahoma Counties include terrace deposits at one or more levels in, or adjacent to, the valleys of the Canadian and North Canadian Rivers, alluvium in the valleys of the principal streams, and dune sand. The areal distribution of the deposits is shown on the geologic map (pl. I), and their lithologic character and general hydrologic properties are summarized in table 2.

The Quaternary deposits supply ground water for rural, domestic, and stock purposes at many places in the two counties, and they are the source of most of the ground water used to satisfy the water needs of several small towns and unincorporated communities in the valleys of the Canadian and North Canadian Rivers. However, except for two areas along the Canadian River near Norman and an area along the North Canadian River between Oklahoma City and Lake Overholser, they have not been studied in detail.

The terrace deposits and dune sand overlie the Permian rocks and, because of their relatively high permeability, facilitate the recharge of the underlying rocks. Because the Quaternary deposits are more permeable than the Permian redbeds, springs, seeps, or "wet-weather springs" occur where the contact between the two is exposed in low areas. The alluvium generally fills valleys cut 20 to 100 or more feet below the uplands. Because of this topographic relationship, the alluvium receives some seepage from sandy units or fractured zones in the bedrock. This seepage helps to maintain a high water table in the alluvium. Water in the alluvium is discharged principally by evaporation and transpiration, but some moves downstream in the alluvial deposits, and some seeps into the stream channels to maintain flow in dry seasons.

TERRACE DEPOSITS

Terrace deposits consist of materials laid down by ancient streams, which, since the time of deposition, have cut valleys to lower levels. In Cleveland and Oklahoma Counties, the streams that made the deposits were ancestors of the Canadian and North Canadian Rivers. The deposits consist mostly of lenticular beds of sand, silt, clay, and gravel, which vary greatly in thickness within short lateral distances. Where they have sufficient saturated thickness, the terrace deposits yield larger quantities of water of lower mineralization than that in the Permian rocks, and, on the whole, water of

TABLE 2—GEOLOGIC UNITS EXPOSED IN CLEVELAND AND OKLAHOMA COUNTIES

System	Series	Stratigraphic Unit	Thickness (Feet)	Description and Distribution	Water-Bearing Properties
QUATERNARY	Recent	Dune sand	0-20	Fine-to coarse-grained wind-blown sand Consists chiefly of subrounded quartz grains Forms a thin mantle or hummocky surface that obscures older rocks Most extensive deposits on north side of North Canadian River near Lake Overholser	Moderately to highly permeable, but mostly above the water table and saturated only locally Where saturated, yields water readily to domestic or stock wells but supply may not be permanent Water most likely to occur in this unit where underlain by poorly permeable redbeds Provides infiltration areas for recharge to underlying rocks
	Pleistocene and Recent	Alluvium	0-70	Unconsolidated and interfingering lenses of sand, silt, clay, and gravel in the flood plains and channels of streams	Moderately permeable Yields small to moderate quantities of water to wells in valleys of larger streams Water is very hard, but suitable for most uses, unless contaminated by industrial wastes or oil-field brines
		Terrace deposits	0 100	Unconsolidated and interfingering lenses of sand, silt, gravel, and clay that occur at one or more levels above the flood plains of the principal streams	Moderately permeable Locally above the water table and not saturated Where deposits have sufficient saturated thickness, they are capable of yielding moderate quantities of water to wells Water is moderately hard to very hard, but less mineralized than water in other aquifers Suitable for most uses unless contaminated by oil-field brines
PERMIAN	Lower Permian	Chickasha Formation and Duncan Sandstone	200 ±	Beds of reddish-brown sandstone, siltstone, shale, and siltstone conglomerate Individual beds of sandstone highly cross-bedded and well cemented, in western part of area between Canadian and North Canadian Rivers	Poorly permeable Tapped by only a few small-capacity wells for domestic or stock use Water is hard and in places highly mineralized
		Hennessey Shale	700	Deep-red clay shale containing thin beds of red sandstone and white or greenish bands of sandy or limy shale Forms relatively flat to gently rolling grass-covered prairies	Poorly permeable Yields meager quantities of very hard, moderately to highly mineralized water to shallow domestic and stock wells In places water contains large amounts of sulfate
		Garber Sandstone	500 ±	Deep-red to reddish-orange, massive and cross-bedded fine-grained sandstone interbedded with and interfingered with red shale and siltstone	Poorly to moderately permeable Important source of ground water in Cleveland and Oklahoma Counties Yields small to moderate quantities of water to deep wells, heavily pumped for industrial and municipal uses in the Norman and Midwest City areas Water from shallow wells hard to very hard, water from deep wells moderately hard to soft Lower part contains water too salty for domestic and most industrial uses
		Wellington Formation	500 ±	Deep-red to reddish-orange massive and cross-bedded fine-grained sandstone irregularly interbedded with red, purple, maroon, and gray shale Base of formation not exposed in the area	

better quality than that in the alluvium. Replenishment of ground water in the terrace deposits comes mainly from infiltration of precipitation that falls on the terrace surface.

The terrace deposit on the upland between Lake Overholser and Lake Hefner (pl. I), known locally as the Bethany terrace, is the source of the ground water pumped by the city of Bethany (Jacobsen and Reed, 1949). The deposit also supplies water to many shallow wells used for residential gardening in Bethany, Warr Acres, and adjoining parts of Oklahoma City.

Logs of test holes drilled for the Bethany and Oklahoma City Water Departments indicate that the terrace deposit has a maximum thickness of about 80 feet and that it is thickest over a buried stream channel that curves southward through the central part of sec. 6, SW¼ sec. 5, western part of sec. 8, and SE¼ sec. 7, T. 12 N., R. 4 W. (L. C. Burton, written communication, 1958). Elsewhere, the deposits of the Bethany terrace vary greatly in thickness over short lateral distances, according to the configuration of the buried bedrock surface (Hennessey Shale) and the amount of terrace material removed by erosion.

The depth to water generally is less than 30 feet below land surface. The yields of wells tapping the terrace deposits are not known, but it is likely that, where the saturated thickness is at least 5 feet, properly spaced wells would yield 5 to 10 gpm. Where the saturated thickness is more than 50 feet, properly spaced and developed wells should be capable of sustained yields of 100 to more than 200 gpm.

Other terrace deposits that occur in Oklahoma County, as shown on plate I, have not been studied by the U. S. Geological Survey and are not known to have been tested as a source of ground water for large-capacity wells; hence, their ground-water potential is not known.

Terrace deposits also were mapped along the upland bordering the Canadian River in Cleveland County. However, except for an area near Norman (Stacy, 1961), the deposits have not been studied by the U. S. Geological Survey and their ground-water potential is little known.

According to Stacy (1961), the terrace deposits in the vicinity of Norman contain considerable quantities of water of good quality at depths generally less than 50 feet below land surface. The logs of test holes indicate that the deposits range from 40 to 95 feet in thickness and that their saturated thickness averages 40 feet. At favorable sites, wells that are properly constructed and developed should be capable of producing as much as 200 gpm.

ALLUVIUM

The modern channels, flood plains, and low terraces along the Canadian, North Canadian, and Little Rivers and their major tributaries are covered with alluvium (pl. I). These deposits represent the present cycle of erosion and deposition, and the deposits are still being formed, eroded, and reworked. The flood plains generally are 5 to 10 feet lower than the surface of the adjacent low terraces, and the stream channels are cut as much as 3 or more feet into the flood plains.

Along the Canadian and North Canadian Rivers the alluvium is a band averaging about 2 miles in width, but at Ten-Mile Flat on the Canadian, about 5 miles northwest of Norman, and at Oklahoma City, on the North Canadian, it is more than 3 miles wide. The Canadian River has a sandy shifting channel 1,000 to 6,000 feet wide. Phreatophytes, such as marsh grass, cattails, and willow and cottonwood trees, are common along the channel and on the flood plain in many places.

The alluvium consists mostly of lenticular beds of sand, silt, and clay. It probably also contains some lenticular beds and stringers of gravel and gravelly sand in the lower part. The alluvium ranges in thickness from a few inches to about 90 feet. Thicknesses are greater only where the present stream alluvium is underlain by older alluvium that fills channels cut into the bedrock and commonly referred to as buried stream channels.

The alluvium in the North Canadian River valley in Canadian County has been studied intensively by Mogg, Schoff, and Reed (1960). They showed that these deposits are as much as 60 feet thick in places and contain permeable sand and gravel capable of yielding several hundred gallons of water per minute to wells. These deposits probably have similar properties in the western part of Oklahoma County, where they supply water to numerous industrial wells and to emergency-supply wells drilled by Oklahoma City (table 3).

At Ten-Mile Flat on the Canadian River the alluvium has a maximum thickness of about 70 feet. The alluvium is thickest over a buried stream channel that approximately parallels the eastern margin of the flat in secs. 4, 5, 9, 16, 21, 28, 33, T. 9 N., R. 3 W. Information obtained from the logs of 32 test holes drilled by the U. S. Navy and the logs of many geophysical shotholes furnished by the Carter Oil Company indicate that throughout much of its length the buried channel was 1,000 to 2,000 feet wide, that it was cut 25 or more feet below the bedrock surface in other parts of the flat, and that its base was 110 to 140 feet below the upland surface immediately to the east (Jacobsen and Reed, written communication, 1943).

The data collected by Jacobsen and Reed indicate that along the buried stream channel the alluvium may average 60 feet in thickness, and that in other parts of the flat it may range in thickness from 20 to about 40 feet.

The depth to water in 1943 was about 10 feet below land sur-

HYDROLOGY OF THE GARBER SANDSTONE AND WELLINGTON FORMATION

The Garber Sandstone and Wellington Formation constitute the most important source of ground water in Cleveland and Oklahoma Counties. The cities of Edmond, Nichols Hills, Del City, Midwest City, Moore, and Norman, and many small towns obtain all their water supplies from wells completed in one or both of the formations.* Tinker Air Force Base, a major service facility in the national-defense establishment, The University of Oklahoma, Central State Griffin Memorial Hospital, and many commercial and industrial firms also obtain their water supplies from wells tapping one or both formations. Oklahoma City and several commercial and industrial establishments in the city have wells in one or both formations. Since the 1951-1956 drought, the Oklahoma City wells and many of the commercial wells have been little used, but they are maintained on a standby basis.

The Garber and Wellington constitute a single aquifer, or water-bearing zone. The two formations were deposited under similar conditions, and both consist of lenticular beds of sandstone, siltstone, and shale that may vary greatly in thickness within short lateral distances. Wells drilled into the water-bearing zone may tap individual beds of sandstone as much as 50 feet thick and may penetrate as much as 200 to 300 feet of water-bearing sandstone. Other wells drilled nearby may tap only a few relatively thin beds of sandstone and may penetrate less than 100 feet of water-bearing material.

Thickness of the Fresh-Water Zone

Wells obtain fresh water from the Garber and Wellington at depths of 100 feet or less in the areas of outcrop and at maximum depths of about 1,000 feet in the structural depression in the Midwest City area. The maximum depth at which wells obtain potable water supplies is controlled by the depth at which salt water is encountered in these formations (fig. 4). The contact between the fresh water and salt water probably is not abrupt because an intermediate brackish-water zone has been found in some wells. Where such brackish water is encountered, the wells commonly are plugged back and completed in a higher water-bearing zone.

The approximate depths below land surface of the base of the fresh-water body in different parts of the area are as follows: near

* Since completion of this report, the Lake Thunderbird reservoir has been completed, and Norman now derives all public water supplies from this source, maintaining the old wells on a standby basis. Del City and Midwest City fulfill their needs from both the reservoir and wells.

Canadian River in southeastern Cleveland County, 100 feet; Noble, 400 feet; Norman, 700 feet; Moore, 850 feet; southwest corner Oklahoma County, 1,000 feet; Harrah, 300 feet; Choctaw, 640 feet; Midwest City, 1,000 feet; Oklahoma City-Lake Hefner area, 800 feet; Edmond, 700 feet; and Luther, 200 feet.

Figure 4 is a contour map of the base of the fresh-water body. The base was determined from electric logs of oil and gas wells, drillers' logs, and chemical analyses of water samples obtained from water wells. The bottom of the lowermost fresh-water sandstone at any location was assumed to be the base of the fresh-water section. However, if that sandstone grades laterally into shale, the next higher sandstone that would have been chosen as the base of the fresh-water body in an adjacent well may be several tens of feet higher.

In general, the base of the fresh-water body in the two counties has the shape of an elongate westward-tilted trough, trending slightly west of north and parallel to the regional strike of the geologic formations. In most places the base of the fresh-water body dips westward at rates ranging from 10 to 20 feet per mile. The steep rise, or gradient, which extends northward along the west side of the two counties from a point near Norman, probably represents the limit to which salt water has been flushed from individual sandstone beds in the Garber Sandstone and Wellington Formation. Although the contact between fresh and salt water is represented as a sharply defined one, there is probably a transition zone in which fresh water gradually grades into salt water.

The contours on the base of the fresh-water body reflect some structural features in the Garber and Wellington. Thus, the greatest depth of fresh water corresponds to the Midwest City depression and the shallower depth of fresh water southeast of Oklahoma City corresponds to the Oklahoma City anticline. However, the steep rise in the slope of the contact between the fresh water and the salt water at the west edge of the map is unrelated to rock structure and may reflect a change of facies from coarser to finer sediments.

Two cross sections (figs. 5, 6) illustrate the lensing and interfingering of sandstone, shale, and silty beds in short lateral distances and show the approximate base of the fresh-water body as determined from figure 4. Section A-A′ (fig. 5) is a small-scale electric-log section drawn from east to west across the Oklahoma City area, following roughly the direction of dip. The section shows the lenticular character of the individual beds and lithologic units that makes it difficult or impossible to correlate such units from well to well. However, the approximate base of the fresh-water body is indicated on the section.

Section B-B′ (fig. 6) is a detailed lithologic section based upon

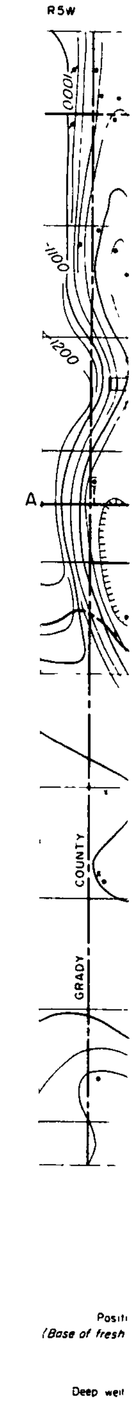


Figure 4. Map showing the base of fresh ground water in Cleveland and Oklahoma Counties. Cross section A-A′ is shown in figure 5.

REFERENCE 19

RECORD OF COMMUNICATION

X	Phone Call		Discussion		Field Trip
	Conference		Other (Specify)	Ref. 31	

TO: Bob Thomas
Hydrogeologist
Groundwater Division

Oklahoma Water Resources Board (405) 271-2575

FROM: Heather Schijf
ICF Technology

FIT Biologist
(214) 744-1641

DATE: 10-21-88

TIME: 1:00 pm

SUBJECT: Groundwater Below The Wiley Post Airport

SUMMARY OF COMMUNICATION:

I called to ask Mr. Thomas if the Hennessey shale acted as a confining layer. He said that it did but it was a confining layer to the Garber Wellington. He proceeded to explain the usable water layers. The following is a summary of that explanation. He said that the majority of the water for private and municipal wells for the immediate vaccinity of the Wiley Post Airport is obtained from the terrace deposits which lay above the alluvial deposits. The alluvial deposits lay above the Garber Wellington. There is not a distinct separating layer between the terrace deposits and the alluvium. The Hennessey shale is interspersed in this area just above the Garber Wellington. In this area, the Garber Wellington consists of interspersed lenses of sandstone and clay. Because of this, it is hit or miss in obtaining water from the Garber Wellington. A confining layer is not present between the surface and the terrace deposits and alluvium. Recharge for these water bearing units (terrace/alluvium), if from surface percolation, of precipitation and is therefore the cleanest source of drinking water. Mr. Thomas said that the deeper the water is obtained, the worse the water quality is.

CONCLUSIONS, ACTION TAKEN OR REQUIRED:

INFORMATION COPIES TO:

EPA FORM 1300-6 (7-72)
Replaces EPA HQ Form 5300-3 Which May Be Used Until Supply is Exhausted.

REFERENCE 20

RECORD OF COMMUNICATION

Reference 20

TYPE: Telephone Call **DATE:** 6-6-91 **TIME:** 2:45 p.m.

TO: Kevin Jaynes KJ
FIT Biologist
ICF Technology, Inc.
Dallas, Texas
214-744-1641

FROM: Dan Bridgeforth
Superintendent
City of Bethany
Bethany, Oklahoma
405-789-0920

SUBJECT: Active Wells In Bethany, Oklahoma And Update Of Previously Obtained Information

SUMMARY OF COMMUNICATION

Mr. Bridgeforth explained that there are currently 25 wells pumping from the alluvium and terrace deposits and three wells pumping from the Garber. The alluvium wells are pumped to the water plant and pooled and treated for hardness.

Wells No. 3, 4, 11, 14 and 14 are no longer used. I explained to Mr. Bridgeforth about the map I had from the Air Center, Inc. site. He said that it is still good and the locations are the same.

REFERENCE 21

THE CITY OF BETHANY
IN GOD WE TRUST

CITY OF BETHANY
6700 N. W. 36th Street
P. O. Box 219
Bethany, OK 73008
(405) 789-2146

Heather Schijf
ICS Technology
1509 Main Street, Ste. 900
Dallas, Texas
75201

Heather-

Enclosed is some of the material I have on our wells. The information on our older wellfields is more extensive than the material on our newer wells. If there is anything more we can provide you with, please let us know. We have good drawdown records, as well as records on treated water quality and quantities pumped.

If you need to call me, the best time is at 8:00 AM at the Water Shop.

Sincerely,

Dan Bridgforth

Dan Bridgforth
Utilities Supt.

THE CITY OF BETHANY
IN GOD WE TRUST

DAN BRIDGFORTH
Utilities Superintendent

P.O. BOX 219
6700 N.W. 36TH
BETHANY, OKLA. 73008
(405) 789-2146

PLANT
789-1421
SHOP
789-0920

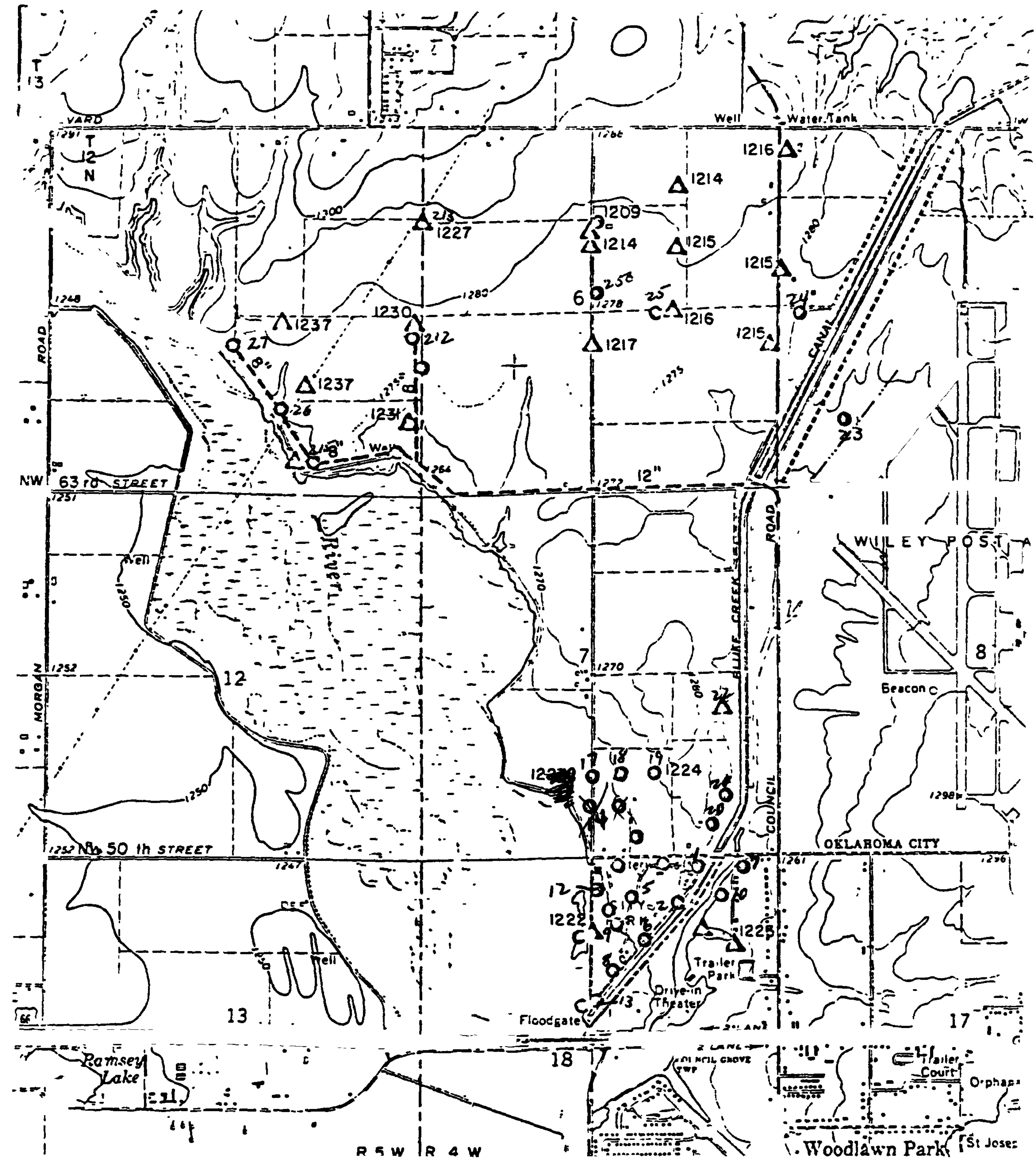
TABLE 3 - WATER QUALITY (mg/l)

	Source	pH	M.Alkalinity	Chloride	Sulphate	Total Hardness	Calcium	Magnesium	Dissolved Solids	Iron	Manganese	Nitrate
	Upper Recommended Limit[1]	--	--	250	350	--	--	125	500	0.3	0.05	45
Bethany Wells	Well #1	7.0	372	117	150	440	150	15.6	902	<0.25	<0.025	0.8
	Well #2	6.9	184	117	160	308	91	19.2	616	0.21	0.025	1.2
	Well #3	7.1	264	146	185	416	135	18.7	842	<0.25	<0.025	0.4
	Well #4	7.1	276	197	200	400	150	6.0	1,012	0.25	2.18	0.2
	Well #5	7.1	322	199	255	528	177	20.4	1,098	<0.25	1.45	0.1
	Well #6	7.1	274	181	202	424	150	11.8	959	0.25	1.35	0.1
	Well #7	7.1	166	53	109	228	74	10.3	469	<0.25	<0.025	2.5
	Well #8	7.2	224	153	172	324	105	14.6	831	<0.25	1.75	0.1
	Well #9	7.3	262	163	192	368	122	15.1	912	<0.25	1.75	0.1
	Well #10	6.9	192	75	172	312	102	13.7	677	<0.25	<0.025	5.0
	Well #12	7.2	322	191	205	472	150	23.3	1,083	0.5	2.25	0.1
	Well #13	7.2	288	177	188	400	145	8.9	998	0.25	2.25	0.2
	Well #14	7.2	266	190	195	404	132	17.8	979	0.25	3.2	0.1
	Well #15	7.2	248	168	180	420	127	24.3	811	0.25	0.05	1.0
	Well #16	7.3	254	175	200	404	150	7.0	949	0.25	<0.025	0.1
	Well #17	7.1	326	198	255	424	152	10.6	1,131	0.4	0.92	0.1
	Well #18	7.1	336	171	205	512	190	8.9	1.046	0.25	<0.025	0.1
	Well #19	7.1	438	164	200	592	220	10.1	1,059	0.4	<0.025	0.1
	Well #20	7.2	324	101	150	364	125	12.2	740	0.25	<0.025	0.8
	Well #21	7.2	264	67	110	288	100	9.1	605	0.25	<0.025	0.75
Oklahoma City Wells	Well #209	7.1	318	195	200	452	158	13.7	991	0.25	2.4	0.4
	Well #210	7.1	218	163	160	380	110	25.2	802	0.5	1.45	0.5
	Well #211	7.2	268	202	200	424	148	13.3	977	0.75	2.8	0.1
	Well #212	7.3	234	58	41	260	88	9.1	405	0.5	<0.025	0.3
	Well #213	7.2	252	9	14	200	70	6.0	238	0.25	<0.025	0.1
	Well #214	7.2	234	102	81	304	115	4.0	500	0.25	<0.025	0.2
	Well #215	7.2	280	153	100	408	145	10.9	711	0.75	<0.025	0.1
	Raw Water[2]	(7.12	302	184		508	364	144	940)	0.25	1.25	( )[3]
	Treated Water[2]	(9.27	58	182		126	54	72	617)	<0.25	0.025	( )[3]

[1]Upper Recommended Limit by U. S. Public Health Service and Oklahoma State Health Department.

[2]Blended water from all Bethany wells.

[3]( ) Analyses by Midco Laboratory.



LEGEND

- Existing Production Well
- Proposed Production Well
- $\Delta_{8"}$ Monitoring Well
- - - - New Pipe Line Required

1223 Measured Water Table Elevation(1978)

Well locations

N

Scale: 1" = 2000'

ENGINEERING Enterprises, Inc.

FIGURE

TABLE 1 - WELL DATA & PERFORMANCE SUMMARY

well #	41 1	42 2	43 ~~3~~ 03	44 ~~4~~	45 5	46 6	47 7
Well Depth (from pump base).	65	68.8	68	65	67.4	65	62.9
Elevation, pump base.[1]	1261.5	1257.4	1259.2	1258.5	1257.2	1254.2	1255.8
Elev. top of dd tube.	1260.6	1256.4	1259.6	1260.8	1256.3	1254.8	1255.8
Maximum desirable pumping depth.	50	53	50	52	50	47	47
Maximum historical pumping level in dd tube.	62	50	60	55	52	47	58
Correction from dd tube to casing pumping level.	--	2.0	0.3	5.0	0.5	0	0.2
Total depth of historical pumping level in casing (L. 5+6).	62+	52	60.3	60	52.5	47	58.2
Elev. total historical pumping level (L. 2-7).	1199.5	1205.4	1198.9	1198.5	1204.7	1207.2	1197.6
Elev. Bottom of well.	1196.5	1188.6	1191.2	1193.5	1189.8	1189.2	1192.9
Historical height of water above well bottom (L. 8-9).	3.0	16.8	7.7	5.0	14.9	18.0	4.7
Desirable height of water above well bottom (L. 1-4).	15	15	15	15	15	15	15
Pumping level above (+) or below (-) desired level.	-12	+1.8	-7.3	-10	- 0.1	+3.0	-9.3
Specific Capacity(gpm/ft)	?	18.8	11.2	9.3	28.0	19.5	7.6
Recommended addition (+) or reduction (-) in well output in gpm.	?	+34	-82	-93	-3	+59	-71

[1] From Davila's 1968 "Comprehensive Report of the Bethany Water System".

TABLE 1 - WELL DATA & PERFORMANCE SUMMARY

well #	48 8 ✓	49 9 ✓	50 10 ✓	51 12 ✓	52 13 ✓	53 ~~14~~ out	54 ~~15~~ out
Well Depth (from pump base).	61.6	63.5	59.4	61.6	56.1	65.9	68.5
Elevation, pump base.[1]	1247.5	1250.4	1254.3	1249.2	1247.2	1254.8	1259
Elev. top of dd tube.	None	None	1253.7	None	1246.9	1253.7	1258.5
Maximum desirable pumping depth.	47	48	44	47	41	50	53
Maximum historical pumping level in dd tube.	--	46	53	--	38	43	54
Correction from dd tube to casing pumping level.	--	--	0.4	--	5.0	17.6	4.0
Total depth of historical pumping level in casing (L. 5+6).	?	46	53.4	?	43	59.6	58
Elev. total historical pumping level (L. 2-7).	--	1204.4	1200.9	--	1204.2	1195.2	1201
Elev. Bottom of well.	1185.9	1186.9	1194.9	1187.6	1191.1	1188.8	1190.5
Historical height of water above well bottom (L. 8-9).	--	17.5	6.0	--	13.1	6.4	10.5
Desirable height of water above well bottom (L. 1-4).	15	15	15	15	15	15	15
Pumping level above (+) or below (-) desired level.	?	+2.5	-9.0	?	-1.9	-8.6	-4.5
Specific Capacity(gpm/ft)	15.4	16.4	10.0	11.4	15.8	6.1	4.2
Recommended addition (+) or reduction (-) in well output in gpm.	?	+41	-90	?	-30	-52	-19

[1]From Davila's 1968 "Comprehensive Report of the Bethany Water System".

TABLE 1 - WELL DATA & PERFORMANCE SUMMARY

Well #	55	56	57	58	59	60
	16	17	18	19	20	21
	No longer used for drinking					
Well Depth (from pump base).	66.6	71.5	77.6	86.6	70.6	70.5
Elevation, pump base.[1]	1257.3	1256.9	1260.2	1267.4	1257.5	1258.2
Elev. top of dd tube.	1256.9	None	None	None	None	None
Maximum desirable pumping depth.	52	56	63	72	56	55
Maximum historical pumping level in dd tube.	55	--	65	74	58	62
Correction from dd tube to casing pumping level.	5.0	--	0	0	0	0
Total depth of historical pumping level in casing (L. 5+6).	60	?	65	74	58	62
Elev. total historical pumping level (L. 2-7).	1196.7	--	1195.2	1193.4	1199.5	1196.2
Elev. Bottom of well.	1188.7	1185.4	1182.6	1180.8	1186.9	1187.7
Historical height of water above well bottom (L. 8-9).	8.0	--	12.6	12.6	12.6	8.5
Desirable height of water above well bottom (L. 1-4).	15	15	15	15	15	15
Pumping level above (+) or below (-) desired level.	-7	?	-2.4	-2.4	-2.4	-6.5
Specific Capacity(gpm/ft)	4.8	6.0	8.5	5.2	20.6	11.2
Recommended addition (+) or reduction (-) in well output in gpm.	-34	?	-20	-12	-50	-73

[1]From Davila's 1968 "Comprehensive Report of the Bethany Water System".

Well #	Well	GPM	Static	Pumping	
61	22	47	24.0	30.0	
62	23	250	42.2	48.0	
63	24	200	64.2	79.9	
64	25	200	64.3	80.3	
65	26	290	19.4	27.5	
66	27	310	21.0	32.5	
67	212	200	61.0	74.9	
68	213	300	65.4	80.1	
69	215	250	24.9	47.5	
70	G-1	300	496.2	504.2	operating
71	G-2	300*	450*	*	
72	G-3	300*	450*	*	

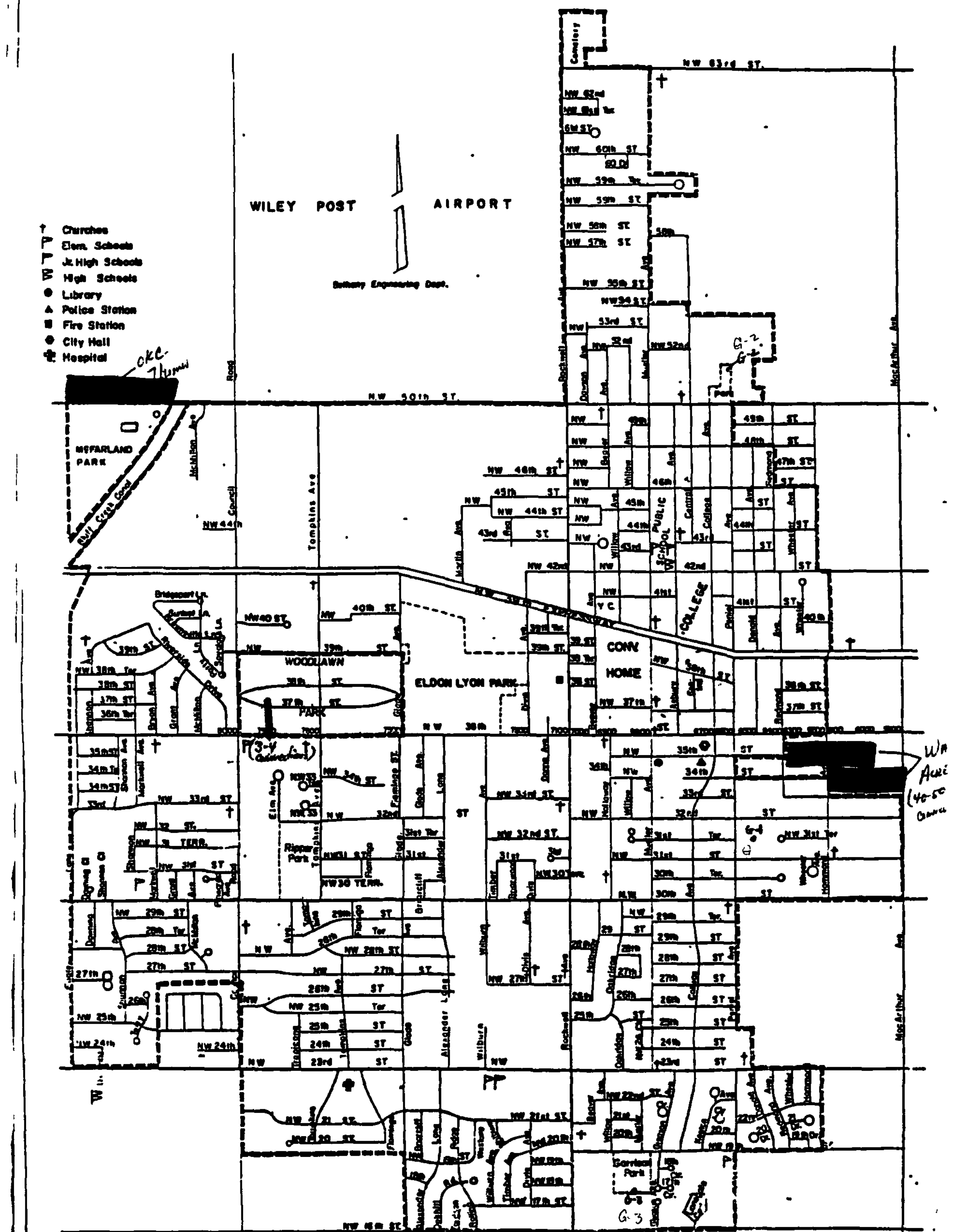
* Proposed Wells, Under Construction

STREET MAP OF

BETHANY, OKLAHOMA

1984

Scale. 1" = 1000'



We serve all of our city limits plus the area shaded in blue.

REFERENCE 22

RECORD OF COMMUNICATION

[X] Phone Call [ ] Discussion [ ] Field Trip

[ ] Conference [ ] Other(Specify)

Ref. 15

(Record of Item Checked Above)

TO:	FROM: HS.	DATE
Dan Bridgeforth Utility Superintendent Bethany Water Dept. OK 405/789-0920	Heather Schijf/ICF Technology	04/16/87
		TIME 8:15 AM - 8:30 AM

SUBJECT
Water Source

SUMMARY OF COMMUNICATION

The city of Bethany water is supplied by 25 wells which draw from the North Canadian alluvial terrace that have a depth of 45-100 ft. Static water level depends on the depth of wells. This water from the North Canadian is sent through the water treatment system before used for drinking water. The city also has one well that draws from the Garber-Wellington Aquifer that has a depth of 822 ft and reaches static water at 496 ft. Approximately 26000 people are served by this system. The Garber-Wellington is not sent through the treatment system. Chlorine is all that is added. Oklahoma City is supplied by 3 reserviors, Lake Hefner and Lake Overholser (source is Lake Canton via the North Canadian River. Draper Reservoir source is the Lake Atoka via the Atoka pipe line approx. 450,000 people are served. Woodlake pond is located in Woodlake subdivision and is classifed for recreational use light boating and some fishing - possibly no swimming, sending map of well locations. Called 4/21/87 8:30 am. Asked him to send a map showing the service boundries of Bethany. The water is pooled/mixed after coming out of wells before treatment system.

CONCLUSIONS, ACTION TAKEN OR REQUIRED

INFORMATION COPIES
TO:

EPA Form 1300-6 (7-72)
Replaces EPA HQ Form 5300-3 Which May Be Used Until Supply is Exhausted.

REFERENCE 23

RECORD OF COMMUNICATION	[X] Phone Call [ ] Discussion [ ] Field Trip [ ] Conference [ ] Other (Specify) Ref. 32	
TO: Mr. Craig Davis Bethany Water Plant (405) 789-1421	FROM: Heather Schijf ICF Technology FIT Biologist (214) 744-1641	DATE: 10-21-88 TIME: 4:21 pm

SUBJECT: Alternate Source Of Drinking Water

SUMMARY OF COMMUNICATION:

I asked Mr. Davis if the City of Bethany had an alternate source of drinking water or was groundwater the only source. He said that groundwater was the only source and that they did not have an alternate source.

CONCLUSIONS, ACTION TAKEN OR REQUIRED:

INFORMATION COPIES TO:

EPA FORM 1300-6 (7-72)
Replaces EPA HQ Form 5300-3 Which May Be Used Until Supply is Exhausted.

REFERENCE 24

RECORD OF COMMUNICATION	[X] Phone Call [ ] Discussion [ ] Field Trip [ ] Conference [ ] Other(Specify) Ref. 16	
	(Record of Item Checked Above)	
TO: City of Warr Acres 405/789-2892	FROM: Ravinder Joseph ICF Technology	DATE 05/29/87 TIME 15:00

SUBJECT
Air Center - Well Information

SUMMARY OF COMMUNICATION
There is no water department in the city. The water is supplied by the Oklahoma City.

CONCLUSIONS, ACTION TAKEN OR REQUIRED

INFORMATION COPIES
TO:

EPA Form 1300-6 (7-72)
Replaces EPA HQ Form 5300-3 Which May Be Used Until Supply is Exhausted.

REFERENCE 25

Well Log Data for 3 miles around Air Center, Inc 1983 to 1985 And for Bethany well locations

Well #	Depth of Well	Static water level	SCREEN interval	Use	0-1	1-2	2-3	>3
1	15.2'	9.6'	5-15'	test/monitoring		I		
–	15.2	8.7	5.5-15.5	-do-		I		
3	17.0	8.7	5-15	-do-		I		
4	17.0	9.5	5-15	-do-		I		
5	17.0	6.1	5-15	-do-		I		
6	150	10.2	45-14.5	do		I		
7	17.0	8.2	6-16	do		I		
8	40.0	20.0	20-40	Domes'	I			
9	550	25	45-55	-do-		I		
10	40	17	20-40	-do-		I		
11	870	373	550-757	Industrial			I	
12	75	10	20-25 45-50 70-75	Domestic			I	
13	50	20	40-50	Domestic				I
14	60	20	40-60	-do-			I	
city of Bethany well G-1 → 15	827	370	538- 666-680 700-7.4 786-816	Municipal			I	
→ 16	827	370	-do-	-do-			I	
→ 17	827	–	-do-	-do-			I	
18	80	40	60-80	Domestic			I	
19	45	36	38-45	-do-			I	
20	60	20	40-60	-do-			I	
21	60	25	40-60	-do			I	
22	100	25	25-30 50-55 75-80 95-100	do				I
23	160	–	–	-do				I
24	120	60	40-45 65-70 84-90 110-120	-do				I
25	140	–	–	-do-				I
26	80	28	65-75	-do-			I	
27	100	18	20-25 45-50 70-75 95-100	-do-			I	
28	78	26	65-75	-do-			I	
29	78	26	65-75	-do-			I	
30	200	–	110-130 170-200	-do-	I			
31	120	90	80-90 110-120	do			I	
city of Bethany wells → 32	61	–	34-40 53-59	Municipal			I	
→ 33	69	–	54-69	-do-			I	
34	60	20	40-60	Domestic			I	
35	180	70	80-90 110-120 140-150 170-180	Domestic			I	
36	180	15	80-90 110-120 140-150 170-180	-do-			I	

Distance from [illegible]

00001

0000001

A 1

Well #	Depth of Well	Static water level	Screen interval	Use	0-1	1-2	2-3	>3
37	50.	65	80-90, 110-120, 140-150	Domestic				1
38	180	100	100-110, 130-140, 160-180	-do-				1
39	180	80	80-90, 110-120, 140-150, 170-180	-do				1
40	120	35	40-45, 55-70, 90-95, [illegible]	-do-				1
				TOTAL	2	9	20	9
41	65	62		Municipal		1		
42	68.8	52		-do		1		
? 43	68	60.3		-do	?	?	?	?
? 44	65	60		-do	?	?	?	?
45	67.4	52.5		-do-		1		
46	65	47		-do-		1		
47	62.9	58.2		-do-		1		
48	61.6	—		-do			1	
49	63.5	46		-do-			1	
50	59.4	53.4		-do		1		
51	61.6	—		-do-		1		
52	56.1	43		-do			1	
53	65.9	59.5		-do		1		
? 54	68.5	58		-do-	?	?	?	?
? 55	66.6	58.6		-do-	?	?	?	?
56	71.5	—		-do		1		
57	77.6	65.0		-do-		1		
58	86.6	74		-do-		1		
59	70.5	58		-do-		1		
60	70.5	58		-do-		1		
61	—	24.0		-do-		1		
62	—	62.2		-do		1		
63	—	64.2		-do-	1			
64	—	64.3		-do-	1			
65	—	19.4		-do			1	
66	—	21.0		-do-			1	
67	—	61.0		-do		1		
68	—	65.4		-do		1		
69	—	24.9		-do-			1	
70	—	49.2		-do-			1	
71	—	Proposed		-do-		1		
72	—	Proposed		-do-				1
					2	27	27	

00002
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(A 2)

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Pink — Drillers Copy

MULTI-PURPOSE WATER WELL REPORT

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N.E. 10th St., P.O. Box 53585
Oklahoma City, Oklahoma 73152

Application No
Aquifer
Steam System Code
Use Code
County
(Official Use Only)

1. OWNER Frontier Federal Savings & Loan **ADDRESS** 5757 NW Expressway
Oklahoma City, Oklahoma 73132 **PHONE** 722-0959

2. LEGAL DESCRIPTION OF WELL EIM (Circle One) WIM
NW ¼ of NE ¼ of NW ¼ of sec. 3, TWP. 12 N S, RGE 4 ECM; **COUNTY** Oklahoma

3. TYPE OF WORK
☐ New Well ☐ Plugging
☐ Reconditioning Work
☒ Test/Monitoring
Well B-2

4. USE
☐ Domestic
☐ Stock
☒ Test Monitoring

NON-DOMESTIC
☐ Irrigation
☐ Municipal
☐ Industrial
☐ Commercial
☐ Other

5. DRILLING METHOD
☐ Rotary ☐ Rev. Rotary
☐ Cable ☒ Other Continuous Flight Auger
☐ Air

6. LOG

Material	From	To	Saturated
Fill - Sand, Brown	0	1.5	
Fill - Clay, Red-Brown	1.5	3.5	
Clay, Dark Brown to Dark Gray	3.5	8	
Clay, Red-Brown	8	14	x
Highly-Weathered Shale Red-Brown	14	15.2	x

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7. LOCATION PERMIT
If this well is Non-Domestic, has this location been permitted?
☐ Yes ☐ No Permit No

8. NEW WELL CONSTRUCTION DATA
DATES: Started 8-14-85 Completed 8-14-85
Contractor Terracon Consultants SC, Inc.
Driller Layne D. Pech
Diameter Hole 8 in. Total Depth 15.2 ft.

CASING RECORD

	Diameter	From	To
Inside	4 in.	0 ft.	15.2 ft.
Outside	in.	ft.	ft.

Cement Grout Surface Seal ☒ Yes ☐ No
Type of Surface Seal Bentonite to 3.5 feet Depth of Seal: 1 ft
GRAVEL PACKED:
Gravel Packed From 3.5 ft. to 15.2 ft.
Amount Used: 3 ft³

PERFORATION RECORD

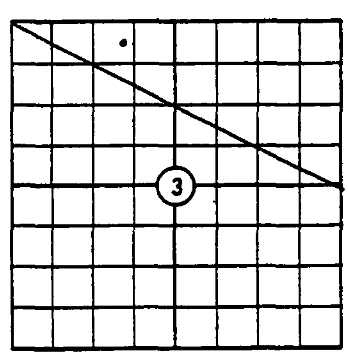
Type Size	From	To
0.01 in.	5 ft.	15 ft.
	ft.	ft.
	ft.	ft.

9. WELL TEST DATA
Static Water Level Below Land Surface 9.6 ft.
If Artesian: Flows gpm.
Approximate Yield gpm.

10. PLUGGING DATA
Date Plugged
Backfilled With Material To ft.
Grouted or Cemented From ft. To ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

11. PLAT

10 AC.



NW ¼ of NE ¼ of NW ¼ of SEC 3
TWP 12 N S; RGE 4 EIM WIM ECM (Circle One)

12. PUMP INFORMATION
Pump Type
Power Source
Rated Capacity gpm.
Depth of Bowls or Cylinder ft.

13. RECONDITIONING WORK
Date Completed
☐ Replaced Casing From ft. To ft.
☐ Replaced Screen From ft. To ft.
Deepened Well From ft. To ft.
Redeveloped Well By

14. CERTIFICATION
The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Gerald W. Finn License # WD-342
Address 832 NW 67th Street Phone # 848-1607
Oklahoma City, Oklahoma 73116
Signed Date 8-26-85

00003

Form 424-0684 USE ADDITIONAL SHEETS IF NECESSARY

White — Water Resources Board
Canary — Drillers Copy
Pink — Drillers Copy

MULTI-PURPOSE WATER WELL REPORT

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N.E. 10th St., P.O. Box 53585
Oklahoma City, Oklahoma 73152

Application No ____
Aquifer ____
Steam System Code ____
Use Code ____
County ____
(Official Use Only)

1. OWNER Frontier Federal Savings & Loan **ADDRESS** 5757 NW Expressway
Oklahoma City, Oklahoma 73132 **PHONE** 722-0959

2. LEGAL DESCRIPTION OF WELL

NW ¼ of NE ¼ of NW ¼ of sec. 3, TWP. 12 N/S; RGE 4 EIM/WIM/ECM (Circle One) [N and WIM circled]; **COUNTY** Oklahoma

3. TYPE OF WORK
- ☐ New Well
- ☐ Plugging
- ☐ Reconditioning Work
- ☒ Test/Monitoring

Well B-3

4. USE
- ☐ Domestic
- ☐ Stock
- ☒ Test Monitoring

NON-DOMESTIC
- ☐ Irrigation
- ☐ Municipal
- ☐ Industrial
- ☐ Commercial
- ☐ Other

5. DRILLING METHOD
- ☐ Rotary
- ☐ Cable
- ☐ Air
- ☐ Rev. Rotary
- ☒ Other Continuous Flight Auger

6. LOG

Material	From	To	Saturated ✓
Fill - Sand, Brown	0	1	
Fill - Clay, Red-Brown	1	3.5	
Clay - Dark Brown to Red-Brown	3.5	11	x
Shaley Clay, Red	11	15.5	x

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7. LOCATION PERMIT

If this well is Non-Domestic, has this location been permitted?

☐ Yes ☐ No Permit No. ____

8. NEW WELL CONSTRUCTION DATA

DATES: Started 8-14-85 Completed 8-14-85
Contractor Terracon Consultants SC, Inc.
Driller Layne D. Pech
Diameter Hole 8 in. Total Depth 15.2 ft.

CASING RECORD

	Diameter	From	To
Inside	4 in.	0 ft.	15.5 ft.
Outside	in.	ft.	ft.

Cement Grout Surface Seal ☒ Yes ☐ No
Type of Surface Seal: ____ Depth of Seal: 1 ft.
GRAVEL PACKED: Bentonite to 4 feet
Gravel Packed From 4.5 ft. to 15.5 ft.
Amount Used: 2.8 ft³

PERFORATION RECORD

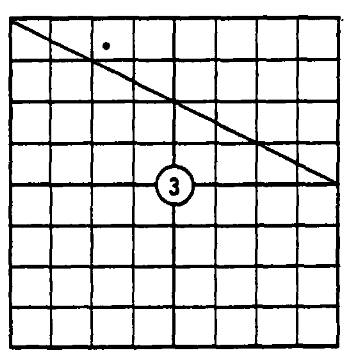
Type Size	From	To
0.01 in.	5.5 ft.	15.5 ft.
	ft.	ft.
	ft.	ft.

9. WELL TEST DATA

Static Water Level Below Land Surface 8.7 ft.
If Artesian: Flows ____ gpm.
Approximate Yield ____ gpm.

11. PLAT

10 AC.



NW ¼ of NE ¼ of NW ¼ of SEC 3;
TWP 12 N/S; RGE 4 EIM/WIM/ECM (Circle One) [N and WIM circled]

10. PLUGGING DATA

Date Plugged ____
Backfilled With ____ Material To ____ ft.
Grouted or Cemented From ____ ft. To ____ ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

13. RECONDITIONING WORK

Date Completed ____
☐ Replaced Casing From ____ ft. To ____ ft.
☐ Replaced Screen From ____ ft. To ____ ft.
Deepened Well From ____ ft. To ____ ft.
Redeveloped Well By ____

12. PUMP INFORMATION

Pump Type ____
Power Source ____
Rated Capacity ____ gpm.
Depth of Bowls or Cylinder ____ ft.

14. CERTIFICATION

The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Gerald W. Finn License # WD-342
Address 832 NW 67th Street Phone # 848-1607
Oklahoma City, Oklahoma 73116
Signed ____ Date 8-26-85

00004

USE ADDITIONAL SHEETS IF NECESSARY

White — Water Resources Board
Canary — Drillers Copy
Pink — Drillers Copy

MULTI-PURPOSE WATER WELL REPORT

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N.E. 10th St., P.O. Box 53585
Oklahoma City, Oklahoma 73152

Application No ______
Aquifer ______
Steam System Code ______
Use Code ______
County ______
(Official Use Only)

1. OWNER Frontier Federal Savings & Loan **ADDRESS** 5757 NW Expressway
Oklahoma City, Oklahoma 73132 **PHONE** 722-0959

2. LEGAL DESCRIPTION OF WELL EIM (Circle One)

NW ¼ of NE ¼ of NW ¼ of sec 3, TWP 12 N S; RGE 4 WIM ECM; COUNTY Oklahoma

3. TYPE OF WORK
☐ New Well ☐ Plugging
☐ Reconditioning Work
☒ Test/Monitoring

Well B-5

4. USE
☐ Domestic
☐ Stock
☒ Test Monitoring

NON-DOMESTIC
☐ Irrigation
☐ Municipal
☐ Industrial
☐ Commercial
☐ Other

5. DRILLING METHOD
☐ Rotary ☐ Rev. Rotary
☐ Cable ☒ Other Continuous Flight Auger
☐ Air

6. LOG

Material	From	To	Saturated ✓
Fill - Clay, Dark Red-Brown to Red-Brown	0	3	
Clay - Dark Brown to Red-Brown	3	10.5	x
Highly Weathered Silty Shale	10.5	15	x

AUG 29 1985
Oklahoma Water Resources Board

7. LOCATION PERMIT

If this well is Non-Domestic, has this location been permitted?
☐ Yes ☐ No Permit No. ______

8. NEW WELL CONSTRUCTION DATA

DATES: Started 8-14-85 Completed 8-14-85
Contractor Terracon Consultants SC, Inc.
Driller Layne D. Pech
Diameter Hole 8 in. Total Depth 17.0 ft.

CASING RECORD

	Diameter	From	To
Inside	2 in.	0 ft.	15 ft.
Outside	in.	ft.	ft.

Cement Grout Surface Seal ☒ Yes ☐ No
Type of Surface Seal. ______ Depth of Seal: 1 ft.
GRAVEL PACKED: Bentonite to 4 feet
Gravel Packed From 4 ft. to 15 ft.
Amount Used: 3.6 ft³

PERFORATION RECORD

Type Size	From	To
0.01 in.	5 ft.	15 ft.
	ft.	ft.
	ft.	ft.

9. WELL TEST DATA

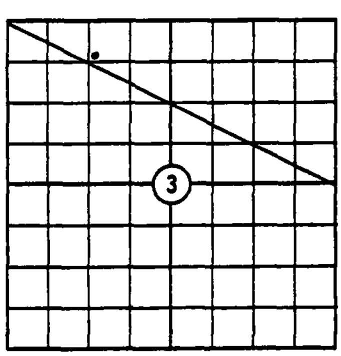
Static Water Level Below Land Surface 8.7 ft.
If Artesian: Flows ______ gpm.
Approximate Yield ______ gpm.

10. PLUGGING DATA

Date Plugged ______
Backfilled With ______ Material To ______ ft.
Grouted or Cemented From ______ ft. To ______ ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

11. PLAT

10 AC



NW ¼ of NE ¼ of NW ¼ of SEC 3,
TWP 12 N S, RGE 4 EIM WIM ECM (Circle One)

12. PUMP INFORMATION

Pump ______
______
______ gpm.
Cylinder ______ ft.

13. RECONDITIONING WORK

Date Completed ______
☐ Replaced Casing From ______ ft. To ______ ft.
☐ Replaced Screen From ______ ft. To ______ ft.
Deepened Well From ______ ft. To ______ ft.
Redeveloped Well By ______

14. CERTIFICATION

The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Gerald W. Finn License # WD-342
Address 832 NW 67th Street Phone # 848-1607
Oklahoma City, Oklahoma 73116
Signed ______ Date 8-26-85

00005

USE ADDITIONAL SHEETS IF NECESSARY

White — Water Resources Board
Canary — Drillers Copy
Pink — Drillers Copy

MULTI-PURPOSE WATER WELL REPORT

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N.E. 10th St., P.O. Box 53585
Oklahoma City, Oklahoma 73152

4

Application No
Aquifer
Steam System Code
Use Code
County
(Official Use Only)

1. OWNER Frontier Federal Savings & Loan **ADDRESS** 5757 NW Expressway
Oklahoma City, Oklahoma 73132 **PHONE** 722-0959

2. LEGAL DESCRIPTION OF WELL EIM (Circle One)

NW ¼ of NE ¼ of NW ¼ of sec. 3, TWP 12 N, S, RGE 4 WIM ECM; **COUNTY** Oklahoma

3. TYPE OF WORK
☐ New Well ☐ Plugging
☐ Reconditioning Work
☒ Test/Monitoring

Well B-6

4. USE
☐ Domestic
☐ Stock
☒ Test Monitoring

NON-DOMESTIC
☐ Irrigation
☐ Municipal
☐ Industrial
☐ Commercial
☐ Other

5. DRILLING METHOD
☐ Rotary ☐ Rev. Rotary
☐ Cable ☒ Other Continuous Flight Auger
☐ Air

6. LOG

Material	From	To	Saturated ✓
Fill - Clay, Dark Brown to Red-Brown	0	4	
Clay, Dark Brown to Red-Brown	4	14	x
Highly Weathered Shale Red	14	15	x

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7. LOCATION PERMIT

If this well is Non-Domestic, has this location been permitted?

☐ Yes ☐ No Permit No.

8. NEW WELL CONSTRUCTION DATA

DATES: Started 8-14-85 Completed 8-14-85
Contractor Terracon Consultants SC, Inc.
Driller Layne D. Pech
Diameter Hole 8 in. Total Depth 17.0 ft.

CASING RECORD

	Diameter	From	To
Inside	2 in.	0 ft.	15 ft.
Outside	in.	ft.	ft.

Cement Grout Surface Seal ☒ Yes ☐ No
Type of Surface Seal. Depth of Seal. 1 ft
GRAVEL PACKED: Bentonite to 3.5 feet
Gravel Packed From 3.5 ft. to 15 ft.
Amount Used: 3.7 ft³

PERFORATION RECORD

Type Size	From	To
0.01in	5 ft.	15 ft
	ft.	ft.
	ft.	ft.

9. WELL TEST DATA

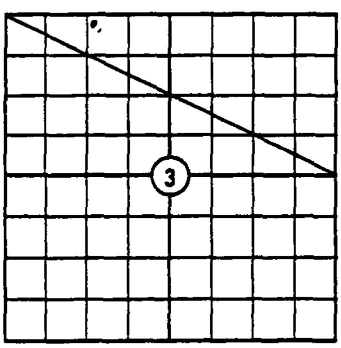
Static Water Level Below Land Surface 9.5 ft.
If Artesian: Flows gpm.
Approximate Yield gpm.

10. PLUGGING DATA

Date Plugged
Backfilled With Material To ft.
Grouted or Cemented From ft. To ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

11. PLAT

10 AC



NW ¼ of NE ¼ of NW ¼ of SEC 3;
TWP 12 N S, RGE 4 (Circle One) EIM WIM ECM

13. RECONDITIONING WORK

Date Completed
☐ Replaced Casing From ft. To ft.
☐ Replaced Screen From ft. To ft.
Deepened Well From ft. To ft.
Redeveloped Well By

12. PUMP INFORMATION

Pump Type
Power Source
...city gpm.
...owls or Cylinder ft.

14. CERTIFICATION

The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Gerald W. Finn License # WD-342
Address 832 NW 67th Street Phone # 848-1607
Oklahoma City, Oklahoma 73116
Signed Date 8-26-85

00006

USE ADDITIONAL SHEETS IF NECESSARY

White — Water Resources Board
Canary — Drillers Copy
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MULTI-PURPOSE WATER WELL REPORT

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N.E. 10th St., P.O. Box 53585
Oklahoma City, Oklahoma 73152

Application No
Aquifer
Steam System Code
Use Code
County
(Official Use Only)

1. OWNER Frontier Federal Savings & Loan **ADDRESS** 5757 NW Expressway
Oklahoma City, Oklahoma 73132 **PHONE** 722-0959

2. LEGAL DESCRIPTION OF WELL

NW ¼ of NE ¼ of NW ¼ of sec. 3, TWP 12 N; S; RGE 4 EIM WIM (Circle One) ECM; **COUNTY** Oklahoma

3. TYPE OF WORK
☐ New Well ☐ Plugging
☐ Reconditioning Work
☒ Test/Monitoring
Well B-7

4. USE
☐ Domestic
☐ Stock
☒ Test Monitoring

NON-DOMESTIC
☐ Irrigation
☐ Municipal
☐ Industrial
☐ Commercial
☐ Other

5. DRILLING METHOD
☐ Rotary ☐ Rev. Rotary
☐ Cable ☒ Other Continuous Flight Auger
☐ Air

6. LOG

Material	From	To	Saturated ✔
Fill - Clay, Red-Brown	0	4	
Clay - Brown to Red-Brown	4	11	
Highly-Weathered Shale Red	11	15	

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Oklahoma Water Resources Board

7. LOCATION PERMIT
If this well is Non-Domestic, has this location been permitted?
☐ Yes ☐ No Permit No.

8. NEW WELL CONSTRUCTION DATA
DATES: Started 8-14-85 Completed 8-14-85
Contractor Terracon Consultants SC, Inc.
Driller Layne D. Pech
Diameter Hole 8 in Total Depth 17.0 ft.

CASING RECORD

	Diameter	From	To
Inside	2 in.	0 ft.	15 ft.
Outside	in.	ft.	ft.

Cement Grout Surface Seal ☒ Yes ☐ No
Type of Surface Seal: Bentonite to 3.5 feet Depth of Seal: 1 ft.
GRAVEL PACKED:
Gravel Packed From 3.5 ft. to 15 ft.
Amount Used: 3.7 ft³

PERFORATION RECORD

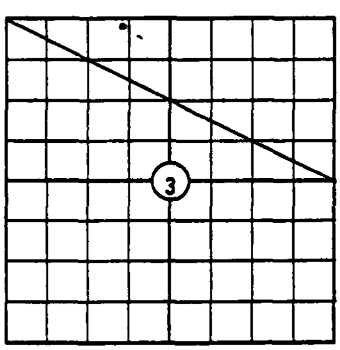
Type Size	From	To
0.01 in.	5 ft.	15 ft.
	ft.	ft.
	ft.	ft.

9. WELL TEST DATA
Static Water Level Below Land Surface 6.1 ft.
If Artesian: Flows gpm.
Approximate Yield gpm.

10. PLUGGING DATA
Date Plugged
Backfilled With Material To ft.
Grouted or Cemented From ft. To ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

11. PLAT

10 AC.



NW ¼ of NE ¼ of NW ¼ of SEC 3;
TWP 12 N; S; RGE 4 EIM WIM ECM (Circle One)

12. PUMP INFORMATION
Pump Type
Power Source
Rated Capacity gpm.
Bowls or Cylinder ft.

13. RECONDITIONING WORK
Date Completed
☐ Replaced Casing From ft. To ft.
☐ Replaced Screen From ft. To ft.
Deepened Well From ft. To ft.
Redeveloped Well By

14. CERTIFICATION
The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Gerald W. Finn License # WD-342
Address 832 NW 67th Street Phone # 848-1607
Oklahoma City, Oklahoma 73116
Signed Date 8-26-85

00007

USE ADDITIONAL SHEETS IF NECESSARY

White — Water Resources Board
Canary — Drillers Copy
Pink — Drillers Copy

MULTI-PURPOSE WATER WELL REPORT

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N.E. 10th St., P.O. Box 53585
Oklahoma City, Oklahoma 73152

Application No. ______
Aquifer ______
Steam System Code ______
Use Code ______
County ______
(Official Use Only)

6

1. OWNER Frontier Federal Savings & Loan **ADDRESS** 5757 NW Expressway
Oklahoma City, Oklahoma 73132 **PHONE** 722-0959

2. LEGAL DESCRIPTION OF WELL EIM (Circle One)

NW ¼ of NE ¼ of NW ¼ of sec 3, TWP. 12 N S; RGE 4 EIM WIM ECM; **COUNTY** Oklahoma

3. TYPE OF WORK
☐ New Well ☐ Plugging
☐ Reconditioning Work
☒ Test/Monitoring

Well B-1

4. USE
☐ Domestic
☐ Stock
☒ Test Monitoring

NON-DOMESTIC
☐ Irrigation
☐ Municipal
☐ Industrial
☐ Commercial
☐ Other

5. DRILLING METHOD
☐ Rotary ☐ Rev. Rotary
☐ Cable ☒ Other Continuous Flight Auger
☐ Air

6. LOG

Material	From	To	Saturated ✓
Fill - Silty Sand Brown to Tan	0	1	
Fill - Sandy Clay Red-Brown	1	4.5	
Clay, Dark Brown to Red-Brown	4.5	12.5	x
Shaley Clay Red-Brown	12.5	15	x

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AUG 29 1985
Oklahoma Water Resources Board

7. LOCATION PERMIT
If this well is Non-Domestic, has this location been permitted?
☐ Yes ☐ No Permit No. ______

8. NEW WELL CONSTRUCTION DATA
DATES: Started 8-14-85 Completed 8-14-85
Contractor Terracon Consultants SC, Inc.
Driller Layne D. Pech
Diameter Hole 8 in. Total Depth 15 ft.

CASING RECORD

	Diameter	From	To
Inside	4 in.	0 ft.	14.5 ft.
Outside	in.	ft.	ft.

Cement Grout Surface Seal ☒ Yes ☐ No
Type of Surface Seal. ______ Depth of Seal: 1 ft.
GRAVEL PACKED: Bentonite to 3.5 feet
Gravel Packed From 3.5 ft. to ______ ft.
Amount Used. 2.9 ft³

PERFORATION RECORD

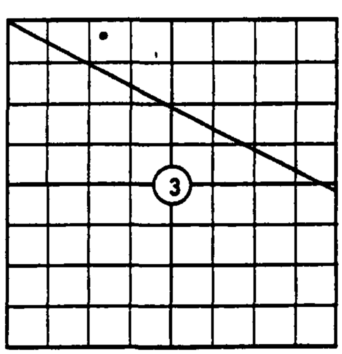
Type/Size	From	To
0.01 in.	4.5 ft.	14.5 ft.
	ft.	ft.
	ft.	ft.

9. WELL TEST DATA
Static Water Level Below Land Surface 10.2 ft.
If Artesian: Flows ______ gpm.
Approximate Yield ______ gpm.

10. PLUGGING DATA
Date Plugged ______
Backfilled With ______ Material To ______ ft.
Grouted or Cemented From ______ ft. To ______ ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

11. PLAT

10 AC.



NW ¼ of NE ¼ of NW ¼ of SEC 3;
TWP 12 N S; RGE 4 EIM WIM ECM (Circle One)

12. PUMP INFORMATION
Pump Type ______
Power Source ______
Rated Capacity ______ gpm.
Depth of Bowls or Cylinder ______ ft

13. RECONDITIONING WORK
Date Completed ______
☐ Replaced Casing From ______ ft. To ______ ft.
☐ Replaced Screen From ______ ft. To ______ ft.
Deepened Well From ______ ft. To ______ ft.
Redeveloped Well By ______

14. CERTIFICATION
The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Gerald W. Finn License # WD-342
Address 832 NW 67th Street Phone # 848-1607
Oklahoma City, Oklahoma 73116
Signed ______ Date 8-26-85

00008

USE ADDITIONAL SHEETS IF NECESSARY

7

White — Water Resources Board
Canary — Drillers Copy
Pink — Drillers Copy

MULTI-PURPOSE WATER WELL REPORT

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N.E. 10th St., P.O. Box 53585
Oklahoma City, Oklahoma 73152

Application No ____
Aquifer ____
Steam System Code ____
Use Code ____
County ____ (Official Use Only)

1. OWNER Frontier Federal Savings & Loan **ADDRESS** 5757 NW Expressway
Oklahoma City, Oklahoma 73132 **PHONE** 722-0959

2. LEGAL DESCRIPTION OF WELL EIM (Circle One)

NW ¼ of NE ¼ of NW ¼ of sec. 3; TWP. 12 N S; RGE 4 EIM WIM ECM; **COUNTY** Oklahoma

3. TYPE OF WORK
- ☐ New Well
- ☐ Plugging
- ☐ Reconditioning Work
- ☒ Test/Monitoring

Well B-4

4. USE
- ☐ Domestic
- ☐ Stock
- ☒ Test Monitoring

NON-DOMESTIC
- ☐ Irrigation
- ☐ Municipal
- ☐ Industrial
- ☐ Commercial
- ☐ Other

5. DRILLING METHOD
- ☐ Rotary
- ☐ Rev. Rotary
- ☐ Cable
- ☒ Other Continuous Flight Auger
- ☐ Air

6. LOG

Material	From	To	Saturated ✓
Fill - Clay, Red-Brown	0	2.5	
Clay - Brown to Red-Brown	2.5	10	x
Shaley Clay - Red-Brown	10	14	x
Highly Weathered Silty Shale, Red	14	17	x

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7. LOCATION PERMIT

If this well is Non-Domestic, has this location been permitted?

☐ Yes ☐ No Permit No. ____

8. NEW WELL CONSTRUCTION DATA

DATES: Started 8-14-85 Completed 8-14-85
Contractor Terracon Consultants SC, Inc.
Driller Layne D. Pech
Diameter Hole 8 in. Total Depth 17.0 ft.

CASING RECORD

	Diameter	From	To
Inside	2 in.	0 ft.	16 ft.
Outside	in.	ft.	ft.

Cement Grout Surface Seal ☒ Yes ☐ No
Type of Surface Seal: ____ Depth of Seal: 1 ft.
GRAVEL PACKED: Bentonite to 4 feet
Gravel Packed From 4 ft. to 17 ft.
Amount Used: 4.3 ft^3

PERFORATION RECORD

Type Size	From	To
0.01 in.	6 ft.	16 ft.
	ft.	ft.
	ft.	ft.

9. WELL TEST DATA

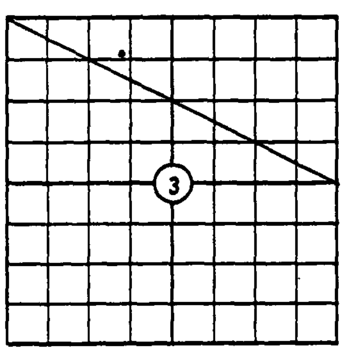
Static Water Level Below Land Surface 8.2 ft.
If Artesian: Flows ____ gpm.
Approximate Yield ____ gpm.

10. PLUGGING DATA

Date Plugged ____
Backfilled With ____ Material To ____ ft.
Grouted or Cemented From ____ ft. To ____ ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

11. PLAT

10 AC.



NW ¼ of NE ¼ of NW ¼ of SEC 3,
TWP 12 N S, RGE 4 (Circle One) EIM WIM ECM

12. PUMP INFORMATION

Pump Type ____
Power Source ____
Rated Capacity ____ gpm.
Depth of Bowls or Cylinder ____ ft.

13. RECONDITIONING WORK

Date Completed ____
☐ Replaced Casing From ____ ft. To ____ ft.
☐ Replaced Screen From ____ ft. To ____ ft.
Deepened Well From ____ ft. To ____ ft.
Redeveloped Well By ____

14. CERTIFICATION

The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Gerald W. Finn License # WD-342
Address 832 NW 67th Street Phone # 848-1607
Oklahoma City, Oklahoma 73116
Signed ____ Date 8-26-85

00009

USE ADDITIONAL SHEETS IF NECESSARY

Form 424-0684

THIS DOCUMENT CONTAINED CONFIDENTIAL INFORMATION WHICH WAS REFILED TO THE PRIVACY ACT/HEALTH CONFIDENTIAL (PC) PHASE/ACTIVITY

DOC # 0005900056

DATE: ______

TITLE: Multi-Purpose Water Well Reports

hite — Water Resources Board
ınary — Drillers Copy
nk — Drillers Copy

MULTI-PURPOSE WATER WELL REPORT

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N.E. 10th St., P.O. Box 53585
Oklahoma City, Oklahoma 73152

Application No
Aquifer
Steam System Code
Use Code
County
(Official Use Only)

. OWNER Riverside Salvage ADDRESS 6800 SW 15th
OKC, OK PHONE 789-7177

. LEGAL DESCRIPTION OF WELL EIM (Circle One)

SE ¼ of NW ¼ of SW ¼ of sec. 9, TWP 12 N S, RGE 4 EIM WIM ECM; COUNTY Oklahoma

, TYPE OF WORK
- New Well
- ☐ Plugging
- Reconditioning Work
- Test/Monitoring

4. USE
- ☒ Domestic
- ☐ Stock
- ☐ Test/Monitoring

NON-DOMESTIC
- ☐ Irrigation
- ☐ Municipal
- ☐ Industrial
- ☐ Commercial
- ☐ Other

5. DRILLING METHOD
- ☒ Rotary
- ☐ Rev. Rotary
- ☐ Cable
- ☐ Other
- ☒ Air

. LOG

Material	From	To	Saturated
Sand Good Gravel	0	31	
Red Bed	31	40	

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Oklahoma Water Resources Board

1. PLAT

10 AC.

X

SE ¼ of NW ¼ of SW ¼ of SEC 9,
TWP 12 N S; RGE 4 EIM WIM ECM (Circle One)

12. PUMP INFORMATION

Pump Type
Power Source
Rated Capacity gpm.
Depth of Bowls or Cylinder ft.

7. LOCATION PERMIT

If this well is Non-Domestic, has this location been permitted?

☐ Yes ☐ No Permit No

8. NEW WELL CONSTRUCTION DATA

DATES: Started 4 October Completed 4th Oct. 85
Contractor Poindexter Drilling
Driller David Poindexter
Diameter Hole 4½ in. Total Depth 40' ft.

CASING RECORD

	Diameter	From	To
Inside	4½ in.	10 ft.	40 ft.
Outside	in.	ft.	ft.

Cement Grout Surface Seal ☒ Yes ☐ No
Type of Surface Seal. Steel + cement Depth of Seal 10' ft.
GRAVEL PACKED:
Gravel Packed From 0 ft. to 40' ft.
Amount Used: all

PERFORATION RECORD

Type Size	From	To
4½	20 ft.	40 ft.
	ft.	ft.
	ft.	ft.

9. WELL TEST DATA

Static Water Level Below Land Surface 17' ft.
If Artesian: Flows gpm.
Approximate Yield 15 gpm.

10. PLUGGING DATA

Date Plugged
Backfilled With Material To ft.
Grouted or Cemented From ft. To ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

13. RECONDITIONING WORK

Date Completed
☐ Replaced Casing From ft. To ft.
☐ Replaced Screen From ft. To ft.
Deepened Well From ft. To ft.
Redeveloped Well By

14. CERTIFICATION

The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Poindexter Drilling License # WD-33
Address 4600 NW 10th OKC Phone # 943-3804
Signed David C. Poindexter Date Sept 85

00012

USE ADDITIONAL SHEETS IF NECESSARY

OWNER LIEBMAN ICE COMPANY ADDRESS 5604 N. MacArthur

Warr Acres, Oklahoma 73122 PHONE 787-9545

LEGAL DESCRIPTION OF WELL EIM

SE SE WIM

¼ of SE ¼ of SE ¼ of sec. 16 ; TWP. 12 N S; Rge. 4W ECM; COUNTY Oklahoma

TYPE OF WORK

New Well ☐ Plugging

Conditioning Well ☒ Test

4. PROPOSED / PAST USE

☐ Domestic ☐ Irrigation ☐ Stock

☐ Municipal ☒ Industrial ☐ Test

5. DRILLING METHOD

☒ Rotary ☐ Rev. Rotary

☐ Cable ☐ Other

Material	From	To	Saturated ✓
sand & gravel	0	45	
sand & shale	45	502	
water	502	508	
shale	508	521	
water	521	530	
shale	530	544	
water	544	550	
shale	550	560	
water	560	576	
shale	576	586	
water	586	622	
shale	622	634	
water	634	641	
shale	641	660	
water	660	694	
shale	694	700	
water	700	709	
shale	709	714	
water	714	722	
shale	722	728	
water	728	746	
shale	746	754	
water	754	768	
shale	768	870	
Lost some hole & plug. Plugged, set bridge plug at 757 to hold plug down.			

Dates: Started December 30, 1980 Completed January 12, 1982

Contractor Poindexter-Thomas Exploration

Driller Larry Brown

Diameter Hole 11¼ in. Total Depth 870 ft.

CASING RECORD

Diameter	From	To
16" in.	0 ft.	57 ft.
8 5/8 in.	0 ft.	805 ft.

Surface Seal: ☐ Yes ☐ No Type: cemented from top to bottom

Depth of Seal: ft.

Gravel Packed:

Gravel Packed From ft. to ft.

Amount Used:

4 shot to the foot

PERFORATION RECORD

Type 401 shots From 550 ft. To 757 ft.

Size From ft. To ft.

" From ft. To ft.

Static Water Level Below Land Surface 373 ft.

If Artesian: Flows gpm.

Water Temp. 62 °c/f Quality 5.5 grains hard

BAILER TEST

Drawdown none ft. After Pumping 16 hrs. At ran bailer

Size of Bailer: 6"x25 gal. 1½ min. off

PUMPING TEST

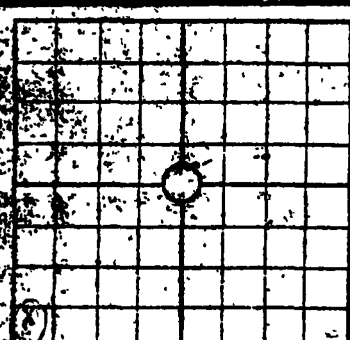
Drawdown 15 ft. After Pumping 24 hrs. At 50

Date Plugged

Backfilled With Material To ft.

Grouted or Cemented From ft. To ft.

Plot Location in Item 11. Show Distances From 2 Section Lines.



SE ¼ of SE ¼ of SEC 16 ;

12 N S; RGE 4W EIM,WIM,ECM

Pump Type submergible

Motor Size 230 V 3 phase

Pump Capacity 50 gpm.

Setting of Pump or Cylinder ft.

Date Completed

☐ Replaced Casing From ft. To ft.

☐ Replaced Screen From ft. To ft.

Deepened Well From ft. To ft.

Redeveloped Well By

The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name David Poindexter License # WD 33

Address 4610 NW 10th Phone # 943-3804

Signed Date

USE ADDITIONAL SHEETS IF NECESSARY

00013

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OKLA. WATER RESOURCES BOARD

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N E 10TH STREET, P O. BOX 53585
OKLAHOMA CITY, OKLAHOMA 73152

MULTI-PURPOSE WATER WELL REPORT

Application No.
Aquifer
Steam System Code
Use Code
County
(Official Use Only)
NA

PAGE 1

1. OWNER Bethany, City of ADDRESS 6700 N.W. 36th Street
Bethany, Oklahoma 73008 PHONE

2. LEGAL DESCRIPTION OF WELL Well No. [illegible]1

NW ¼ of SW ¼ of NE ¼ of sec. 21 ; TWP. 12 N [redacted] Rge. 4 [redacted] WIM [redacted]; COUNTY Oklahoma

3. TYPE OF WORK
- ☒ New Well
- ☐ Plugging
- ☐ Reconditioning Work
- ☐ Test

4. PROPOSED / PAST USE
- ☐ Domestic
- ☐ Irrigation
- ☐ Stock
- ☒ Municipal
- ☐ Industrial
- ☐ Test

5. DRILLING METHOD
- ☐ Rotary
- ☒ Rev. Rotary
- ☐ Cable
- ☐ Other

Material	From	To	Saturated ✓
Clay,sandy	8	18	
Sand,fine grained	18	48	
Clay,very sandy	48	54	
Sand	54	98	
Sandstone w/shale lense	98	125.1	
Shale,sandy,red,dry	125.1	350	
Shale,sandy,red,dry w/sandstone lenses	350	400	
Sandstone w/shale lense dry	400	420	
Shale,sandy,red,dry w/ sandstone lenses	420	467	
Sandstone,red,water	467	560	X
Sandstone,red w/shale seams	560	580	
Shale,sandy,red w/ sandstone lenses	580	610	X
Sandstone,red w/red shale lenses	610	635	X
Sandstone,red	635	650	X
Sandstone,red w/red shale lenses	650	680	X
Shale,red w/sandstone lenses	680	700	
Sandstone,tan	700	710	X
Sandstone,red w/red shale lenses	710	730	X
Sandstone,red-tan	730	760	

Dates: Started 3-30-81 Completed 4-7-81
Contractor Hemphill Corporation
Driller Henkle
Diameter Hole 15 5/8 in. Total Depth 827 ft.

CASING RECORD

Diameter	From	To
8 in.	0 ft.	822 ft.
in.	ft.	ft.

Surface Seal: ☒ Yes ☐ No Type: Cement grout
Depth of Seal: 470 ft.
Gravel Packed:
Gravel Packed From 470 ft. to 827 ft.
Amount Used: 1060 cu. ft.

PERFORATION RECORD

Type Stainless From 538 ft. To 556 ft.
Size Steel Well From 594 ft. To 602 ft.
" Screen - .020 From 626 ft. To 650 ft.
666 to 680; 700 to 714; 728 to 738; 786 to 818.

Static Water Level Below Land Surface 370 ft.
If Artesian: Flows n/a gpm.
Water Temp. 17 °c/°f Quality Good

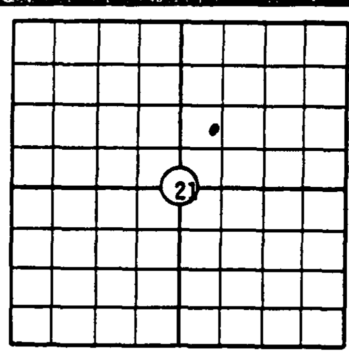
BAILER TEST

Drawdown n/a ft. After Pumping hrs. At gpm.
Size of Bailer: gal.

PUMPING TEST

Drawdown 500 ft. After Pumping 6 hrs. At 600 gpm.

10 AC



NW ¼ of SW ¼ of NE ¼ of SEC 21 ;
TWP 12 N [redacted]; RGE 4 [redacted] WIM [redacted]

Date Plugged n/a
Backfilled With Material To ft.
Grouted or Cemented From ft. To ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

Date Completed n/a
☐ Replaced Casing From ft. To ft.
☐ Replaced Screen From ft. To ft.
Deepened Well From ft. To ft.
Redeveloped Well By

00017

Pump Type Submersible
Power Source 460 V - 3 phase
Rated Capacity 350 gpm.
Depth of Bowls or Cylinder 720 ft.

The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Elmer L. Hemphill License # WD-133
Address 4834 S.83 E.Ave., Tulsa,OK Phone # 918-622-5133
Signed [illegible] Date 7-8-81

USE ADDITIONAL SHEETS IF NECESSARY

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OKLA. WATER RESOURCES BOARD

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N E 10TH STREET, P O BOX 53585
OKLAHOMA CITY, OKLAHOMA 73152

MULTI PURPOSE WATER WELL REPORT

Application No
Aquifer
Stream System Code
Use Code
County
(Official Use Only)

PAGE 2 N/A

OWNER Bethany, City of ADDRESS 6700 N.W. 36th Street
Bethany, Oklahoma 73008 PHONE
LEGAL DESCRIPTION OF WELL Well No. G1

NW ¼ of SW ¼ of NE ¼ of sec. 21 ; TWP. 12 N[redacted]; Rge. 4 [redacted] WIM [redacted]; COUNTY Oklahoma

TYPE OF WORK
☐ New Well ☐ Plugging
☐ Reconditioning Work ☐ Test

4. PROPOSED / PAST USE
☐ Domestic ☐ Irrigation ☐ Stock
☒ Municipal ☐ Industrial ☐ Test

5. DRILLING METHOD
☐ Rotary ☒ Rev. Rotary
☐ Cable ☐ Other

LOG

Material	From	To	Saturated ✓
SHALE, red w/sandstone lenses	760	800	X
Sandstone, red w/red shale lenses	800	827	X

7. NEW WELL CONSTRUCTION DATA

Dates: Started 3-30-81 Completed 4-7-81
Contractor Hemphill Corporation
Driller Henkle
Diameter Hole 15 5/8 in. Total Depth 827 ft.

CASING RECORD

Diameter	From	To
8 in.	0 ft.	822 ft.
in.	ft.	ft.

Surface Seal: ☒ Yes ☐ No Type: Cement grout
Depth of Seal: 470 ft.
Gravel Packed:
Gravel Packed From 470 ft. to 827 ft.
Amount Used: 1060 cu. ft.

PERFORATION RECORD

Type Stainless From 538 ft. To 556 ft.
Size Steel Well From 594 ft. To 602 ft.
" Screen-.020 From 626 ft. To 650 ft.
666 to 680; 700 to 714; 728 to 738; 786 to 818.

8. WELL TEST DATA

Static Water Level Below Land Surface 370 ft.
If Artesian: Flows n/a gpm.
Water Temp. 17 °c/f Quality Good

BAILER TEST

Drawdown n/a ft. After Pumping hrs. At gpm.
Size of Bailer: gal.

PUMPING TEST

Drawdown 500 ft. After Pumping 6 hrs. At 600 gpm.

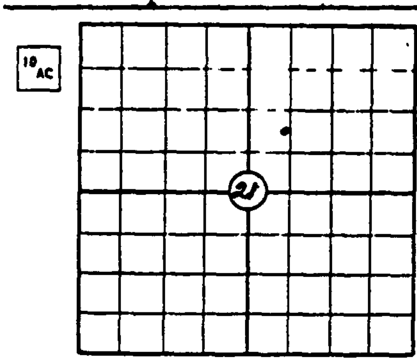
9. PLUGGING DATA

Date Plugged n/a
Backfilled With Material To ft.
Grouted or Cemented From ft. To ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

10. RECONDITIONING WORK

Date Completed n/a
☐ Replaced Casing From ft. To ft.
☐ Replaced Screen From ft. To ft.
Deepened Well From ft. To ft.
Redeveloped Well By

11. PLAT



NW ¼ of SW ¼ of NE ¼ of SEC 21 ;
TWP 12 N[redacted]; RGE 4 [redacted], WIM, [redacted]

12. PUMP INFORMATION

Pump Type Submersible
Power Source 460 V - 3 phase
Rated Capacity 350 gpm.
Depth of Bowls or Cylinder 720 ft.

13. CERTIFICATION

The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Elmer L. Hemphill License # WD-133
Address 4834 S.83 E. Ave., Tulsa, OK. Phone # 918-622-5133
Signed Date 7-8-81

00018

16

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OKLA. WATER RESOURCES BOARD

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N E 10TH STREET, P O BOX 53585
OKLAHOMA CITY, OKLAHOMA 73152

MULTI-PURPOSE WATER WELL REPORT

Application No ______
Aquifer ______
Steam System Code ______
Use Code ______
County ______
(Official Use Only)

PAGE 2 NA

OWNER Bethany, City of ADDRESS 6700 N.W. 36th Street
Bethany, Oklahoma 73008 PHONE ______

LEGAL DESCRIPTION OF WELL Well No. G1

NW ¼ of SW ¼ of NE ¼ of sec. 21 ; TWP. 12 N [redacted]; Rge. 4 [redacted] WIM [redacted]; COUNTY Oklahoma

3. TYPE OF WORK
☒ New Well ☐ Plugging
☐ Reconditioning Work ☐ Test

4. PROPOSED / PAST USE
☐ Domestic ☐ Irrigation ☐ Stock
☒ Municipal ☐ Industrial ☐ Test

5. DRILLING METHOD
☐ Rotary ☒ Rev. Rotary
☐ Cable ☐ Other ______

6. LOG

Material	From	To	Saturated ✓
SHALE, red w/sandstone lenses	760	800	X
Sandstone, red w/red shale lenses	800	827	X

7. NEW WELL CONSTRUCTION DATA

Dates: Started 3-30-81 Completed 4-7-81
Contractor Hemphill Corporation
Driller Henkle
Diameter Hole 15 5/8 in. Total Depth 827 ft.

CASING RECORD

Diameter	From	To
8 in.	0 ft.	822 ft.
in.	ft.	ft.

Surface Seal: ☒ Yes ☐ No Type: Cement grout
Depth of Seal: 470 ft.
Gravel Packed:
Gravel Packed From 470 ft. to 827 ft.
Amount Used. 1060 cu. ft.

PERFORATION RECORD

Type Stainless From 538 ft. To 556 ft.
Size Steel Well From 594 ft. To 602 ft.
" Screen-.020 From 626 ft. To 650 ft.
666 to 680; 700 to 714; 728 to 738; 786 to 818.

8. WELL TEST DATA

Static Water Level Below Land Surface 370 ft.
If Artesian: Flows n/a gpm.
Water Temp. 17 °c/F Quality Good

BAILER TEST

Drawdown n/a ft. After Pumping ___ hrs. At ______ gpm.
Size of Bailer: ______ gal.

PUMPING TEST

Drawdown 500 ft. After Pumping 6 hrs. At 600 gpm

9. PLUGGING DATA

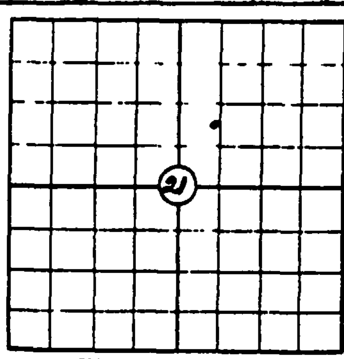
Date Plugged n/a
Backfilled With ______ Material To ______ ft.
Grouted or Cemented From ______ ft. To ______ ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

10. RECONDITIONING WORK

Date Completed n/a
☐ Replaced Casing From ______ ft. To ______ ft.
☐ Replaced Screen From ______ ft. To ______ ft.
Deepened Well From ______ ft. To ______ ft.
Redeveloped Well By ______

11. PLAT

10 AC



NW ¼ of SW ¼ of NE ¼ of SEC 21 ;
TWP 12 N [redacted]; RGE 4 [redacted], WIM, [redacted]

12. PUMP INFORMATION

Pump Type Submersible
Power Source 460 V - 3 phase
Rated Capacity 350 gpm.
Depth of Bowls or Cylinder 720 ft.

13. CERTIFICATION

The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Elmer L. Hemphill License # WD-133
Address 4834 S.83 E. Ave., Tulsa, OK. Phone # 918-622-5133
Signed [redacted] Date 7-8-81

00019

USE ADDITIONAL SHEETS IF NECESSARY

White — Water Resources Board
Canary — Drillers Copy
Pink — Drillers Copy

RECEIVED
JUL 13 1981
OKLA. WATER RESOURCES BOARD

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N E 10TH STREET, P O BOX 53585
OKLAHOMA CITY, OKLAHOMA 73152

MULTI-PURPOSE WATER WELL REPORT

16

Application No. ______
Aquifer ______
Steam System Code ______
Use Code ______
County ______
(Official Use Only)
NA

PAGE 1

1. OWNER Bethany, City of ADDRESS 6700 N.W. 36th Street
Bethany, Oklahoma 73008 PHONE ______

2. LEGAL DESCRIPTION OF WELL Well No. G1 [redacted]
NW ¼ of SW ¼ of NE ¼ of sec. 21 ; TWP. 12 N [redacted] Rge. 4 WIM [redacted]; COUNTY Oklahoma

3. TYPE OF WORK
☒ New Well ☐ Plugging
☐ Reconditioning Work ☐ Test

4. PROPOSED / PAST USE
☐ Domestic ☐ Irrigation ☐ Stock
☒ Municipal ☐ Industrial ☐ Test

5. DRILLING METHOD
☐ Rotary ☒ Rev. Rotary
☐ Cable ☐ Other ______

6. LOG

Material	From	To	Saturated ✓
Clay,sandy	8	18	
Sand,fine grained	18	48	
Clay,very sandy	48	54	
Sand	54	98	
Sandstone w/shale lense	98	125.1	
Shale,sandy,red,dry	125.1	350	
Shale,sandy,red,dry w/sandstone lenses	350	400	
Sandstone w/shale lense dry	400	420	
Shale,sandy,red,dry w/ sandstone lenses	420	467	
Sandstone,red,water	467	560	X
Sandstone,red w/shale seams	560	580	
Shale,sandy,red w/ sandstone lenses	580	610	X
Sandstone,red w/red shale lenses	610	635	X
Sandstone,red	635	650	X
Sandstone,red w/red shale lenses	650	680	X
Shale,red w/sandstone lenses	680	700	
Sandstone,tan	700	710	X
Sandstone,red w/red shale lenses	710	730	X
Sandstone,red-tan	730	760	

7. NEW WELL CONSTRUCTION DATA

Dates: Started 3-30-81 Completed 4-7-81
Contractor Hemphill Corporation
Driller Henkle
Diameter Hole 15 5/8 in. Total Depth 827 ft.

CASING RECORD

Diameter	From	To
8 in.	0 ft.	822 ft.
in.	ft.	ft.

Surface Seal: ☒ Yes ☐ No Type: Cement grout
Depth of Seal: 470 ft.
Gravel Packed:
Gravel Packed From 470 ft. to 827 ft.
Amount Used: 1060 cu. ft.

PERFORATION RECORD

Type Stainless From 538 ft. To 556 ft.
Size Steel Well From 594 ft. To 602 ft.
" Screen - .020 From 626 ft. To 650 ft.
666 to 680; 700 to 714; 728 to 738; 786 to 818.

8. WELL TEST DATA

Static Water Level Below Land Surface 370 ft.
If Artesian: Flows n/a gpm.
Water Temp. 17 °c/[redacted] Quality Good

BAILER TEST

Drawdown n/a ft. After Pumping ______ hrs. At ______ gpm.
Size of Bailer: ______ gal.

PUMPING TEST

Drawdown 500 ft. After Pumping 6 hrs. At 600 gpm.

9. PLUGGING DATA

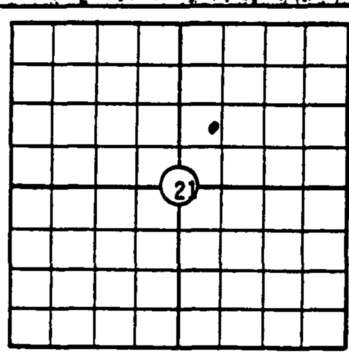
Date Plugged n/a
Backfilled With ______ Material To ______ ft.
Grouted or Cemented From ______ ft. To ______ ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

10. RECONDITIONING WORK

Date Completed n/a
☐ Replaced Casing From ______ ft. To ______ ft.
☐ Replaced Screen From ______ ft. To ______ ft.
Deepened Well From ______ ft. To ______ ft.
Redeveloped Well By ______

11. PLAT

10 AC



NW ¼ of SW ¼ of NE ¼ of SEC 21 ;
TWP 12 N [redacted]; RGE 4 [redacted], WIM, [redacted]

12. PUMP INFORMATION

Pump Type Submersible
Power Source 460 V - 3 phase
Rated Capacity 350 gpm.
Depth of Bowls or Cylinder 720 ft.

13. CERTIFICATION

The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Elmer L. Hemphill License # WD-133
Address 4834 S.83 E.Ave., Tulsa,OK Phone # 918-622-5133
Signed ______ Date 7-8-81

USE ADDITIONAL SHEETS IF NECESSARY

00020

FORM 424-10 78

White — Water Resources Board
Canary — Drillers Copy
Pink — Drillers Copy

OKLAHOMA WATER RESOURCES BOARD
N.E. 10th and Stonewall 12th Floor
Oklahoma City, Oklahoma 73105

STATE OF OKLAHOMA
WATER RESOURCES BOARD
~~5th Floor Jim Thorpe Building~~
Oklahoma City, Oklahoma 73105

MULTI-PURPOSE WATER WELL REPORT

Application No. 17
Aquifer ____
Steam System Code ____
Use Code ____
County ____
(Official Use Only)
NA

1. OWNER City of Bethany ADDRESS Bethany, Oklahoma
The Water Storage Tank at Peniel Ave. & NW 31st. Terrace PHONE ____

2. LEGAL DESCRIPTION OF WELL
NW ¼ of SW ¼ of NE ¼ of sec. 21 ; TWP. 12 N S; Rge. 4 EIM WIM ECM; COUNTY Oklahoma

3. TYPE OF WORK
☒ New Well ☐ Plugging
☐ Reconditioning Work ☐ Test

4. PROPOSED / PAST USE
☐ Domestic ☐ Irrigation ☐ Stock
☒ Municipal ☐ Industrial ☐ Test

5. DRILLING METHOD
☐ Rotary ☒ Rev. Rotary
☐ Cable ☐ Other ____

6. LOG

Material	From	To	Saturated
SEE ATTACHED LOG			

7. NEW WELL CONSTRUCTION DATA

Dates: Started April 1, 1981 Completed April 4, 1981
Contractor Hemphill Corporation
Driller Henkle Drilling & Supply Co., Inc.
Diameter Hole 15 5/8 in. Total Depth 827 ft.

CASING RECORD

Diameter	From	To
8 5/8 in.	0 ft.	8-2 ft.
in.	ft.	ft.

Surface Seal: ☒ Yes ☐ No Type: Cement Grout
Depth of Seal: 508 ft.
Gravel Packed: Colorado Silica Sand
Gravel Packed From 508 ft. to 824 ft.
Amount Used: 17 ton

PERFORATION RECORD
Type S. S. Continuous Slot 786 - 818' 728' - 738' From ft. To ft.
Size 8 5/8 From 700 - 714 ft. To 666 - 680 ft.
" From 626 - 650 538 - 556' ft. To 594 - 602 ft.

8. WELL TEST DATA

Static Water Level Below Land Surface ____ ft.
If Artesian: Flows ____ gpm.
Water Temp. ____ °c/f Quality Hemphill Corp. tested well and installed pump.

BAILER TEST
Drawdown ____ ft. After Pumping ____ hrs. At ____ gpm.
Size of Bailer: ____ gal.

PUMPING TEST
Drawdown ____ ft. After Pumping ____ hrs. At ____ gpm.

9. PLUGGING DATA

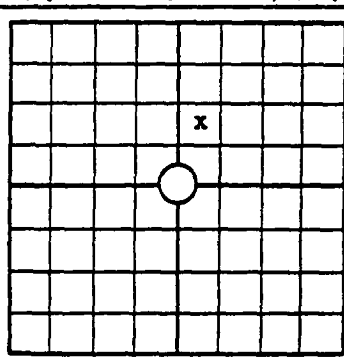
Date Plugged ____
Backfilled With ____ Material To ____ ft.
Grouted or Cemented From ____ ft. To ____ ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

10. RECONDITIONING WORK

Date Completed ____
☐ Replaced Casing From ____ ft. To ____ ft.
☐ Replaced Screen From ____ ft. To ____ ft.
Deepened Well From ____ ft. To ____ ft.
Redeveloped Well By ____

11. PLAT

10 AC.



NW ¼ of SW ¼ of NE ¼ of SEC 21 ;
TWP 12 N S; RGE 4 EIM, WIM, ECM

12. PUMP INFORMATION

Pump Type ____
Power Source ____
Rated Capacity ____ gpm.
Depth of Bowls or Cylinder ____ ft.

13. CERTIFICATION

The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Henkle Drilling & Supply Co., Inc. License # W.D. 120
Address Box 639 Garden City, Ks. Phone # 316-277-2389
Signed [signature] Date 7-2-81

USE ADDITIONAL SHEETS IF NECESSARY

00021

17

DRILLERS TEST LOG

CUSTOMERS NAME City of Bethany DATE March 16, 1981
STREET ADDRESS TEST # 1 E. LOG
CITY & STATE Bethany, Oklahoma DRILLER Vann Bothwell
COUNTY Oklahoma QUARTER NE SECTION 21 TOWNSHIP 12 RANGE 4
LOCATION North Peniel & 31st Terrace, just East of Cement reservoir #G-1

%	FOOTAGE From	Pay	To	DESCRIPTION OF STRATA — Static Water Level ___ Proposed Well Depth 822'
	0		18	Brown Red & Gray Clay, very Sticky
	18		49	Sand, small medium coarse & few small gravel, white & gray in color, very loose.
	49		395	Red Shale & Sandstone stringers, Hennessey Formation.
	395		405	Hard Rock, Red in color, very hard.
	405		460	Red Shale
	460		496	Sandstone, Garber, Wellington Formation
	496		538	Red Shale
	538	27	565	Sandstone
	565		595	Red Shale
	595	9	604	Sandstone
	604		623	Red Shale
	623	137	760	Sandstone & few Red Shale Streaks
	760		782	Red Shale
	782	38	820	Sandstone
	820		831	Red Shale
	831	35	866	Sandstone
	866		1032	Red Shale & Sandstone Streaks

GARDEN CITY, KS HENKLE DRILLING & SUPPLY CO., INC. SUBLETTE, KS
Phone 276-3278 IRRIGATION HEADQUARTERS Phone 675-4311
TEST HOLES * * * * * * IRRIGATION & INDUSTRIAL WELLS * * * * STOCK WELLS

NW ¼ of SW ¼ of NE ¼ of SEC 21 ;
WP 12 N S; RGE 4 EIM, WIM, ECM

2. PUMP INFORMATION

Pump Type ______
Power Source ______
Rated Capacity ______ gpm.
Depth of Bowls or Cylinder ______ ft.

☐ Replaced Casing From ______ ft. To ______ ft.
☐ Replaced Screen From ______ ft. To ______ ft.
Deepened Well From ______ ft. To ______ ft.
Redeveloped Well By ______

13. CERTIFICATION

The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Henkle Drilling & Supply Co., Inc. License # W.D. 120
Address Box 639 Garden City, Ks. Phone # 316-277-2389
Signed Bruce J Reichmuth Date 7-2-81

00022

USE ADDITIONAL SHEETS IF NECESSARY

Canary — Drillers Copy
Pink — Drillers Copy

OKLAHOMA WATER RESOURCES BOARD
N. E. 10th and Stonewall 12th Floor
Oklahoma City, Oklahoma 73105

STATE OF OKLAHOMA
WATER RESOURCES BOARD
~~5th Floor Jim Thorpe Building~~
Oklahoma City, Oklahoma 73105

MULTI PURPOSE WATER WELL REPORT

Application No. 32
Aquifer
Steam System Code
Use Code
County
(Official Use Only)
NA

1 OWNER City of Bethany ADDRESS Bethany Oklahoma

PHONE

2 LEGAL DESCRIPTION OF WELL

SE ¼ of SW ¼ of SE ¼ of sec 1 ; TWP. 12 N S. Rge 5 EIM WIM ECM. COUNTY Canadian

3 TYPE OF WORK	4 PROPOSED / PAST USE	5. DRILLING METHOD
☒ New Well ☐ Plugging	☐ Domestic ☐ Irrigation ☐ Stock	☐ Rotary ☒ Rev. Rotary
☐ Reconditioning Work ☐ Test	☒ Municipal ☐ Industrial ☐ Test	☐ Cable ☐ Other

6. LOG

Material	From	To	Saturated ✓
Surface sand & clay	0	34	
Sand & Gravel	34	40	x
Clay	40	53	
Sand & gravel	53	59	x

7. NEW WELL CONSTRUCTION DATA

Dates: Started March 26, 1981 Completed March 27, 1981
Contractor Hemphill Corporation
Driller Henkle Drilling & Supply Co., Inc
Diameter Hole 18 in. Total Depth 61' ft.

CASING RECORD

Diameter	From	To
8 5/8 in	0 ft	61 ft.
in.	ft	ft

Surface Seal: ☒ Yes ☐ No Type: Cement grout
Depth of Seal: 10 ft.
Gravel Packed 8 - 12 Fountain Sand
Gravel Packed From 10 ft. to 61' ft.
Amount Used 3 3/4 Ton

PERFORATION RECORD

Type S. S. Continuous Slot From 34 - 40 ft. To 53 - 59' ft.
Size 8 5/8 From ft. To ft.
" From ft. To ft.

8. WELL TEST DATA

Hemphill Corporation tested well and installed pump.
Static Water Level Below Land Surface ft.
If Artesian: Flows gpm.
Water Temp. °c/f Quality

BAILER TEST

Drawdown ft. After Pumping hrs. At gpm
Size of Bailer: gal.

PUMPING TEST

Drawdown ft. After Pumping hrs At gpm.

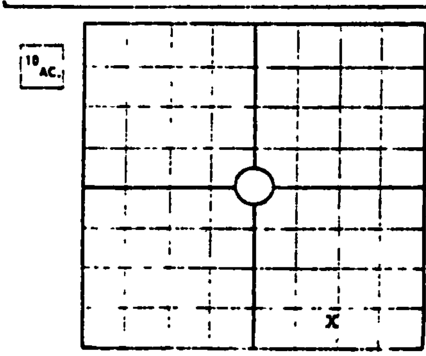
9. PLUGGING DATA

Date Plugged
Backfilled With Material To ft.
Grouted or Cemented From ft. To ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

10. RECONDITIONING WORK

Date Completed
☐ Replaced Casing From ft. To ft.
☐ Replaced Screen From ft. To ft.
Deepened Well From ft. To ft.
Redeveloped Well By

11. PLAT



SE ¼ of SW ¼ of SE ¼ of SEC 1 ;

TWP. 12 N S RGE 5 EIM WIM ECM

12. PUMP INFORMATION

Pump Type
Power Source
Rated Capacity gpm.
Depth of Bowls or Cylinder ft

13. CERTIFICATION

The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Henkle Drilling & Supply Co., Inc License # W.D. 120
Address Box 639 Garden City, Ks. 67846 Phone # 316-277-238
Signed [signature] Date July 2, 19

USE ADDITIONAL SHEETS IF NECESSARY

00037

White — Water Resources Board
Canary — Drillers Copy
Pink — Drillers Copy

STATE OF OKLAHOMA
WATER RESOURCES BOARD
~~5th Floor Jim Thorpe Building~~
Oklahoma City, Oklahoma 73105

N. E. 10th ... 12th Floor
Oklahoma City, Oklahoma 73105

MULTI-PURPOSE WATER WELL REPORT

Application No 33
Aquifer
Steam System Code
Use Code
County
(Official Use Only)

NA

1 OWNER City of Bethany ADDRESS Bethany, Oklahoma

PHONE

2. LEGAL DESCRIPTION OF WELL

NW ¼ of NW ¼ of SE ¼ of sec. 1 ; TWP. 12 N S. Rge. 5 EIM WIM ECM. COUNTY Canadian

3 TYPE OF WORK
☒ New Well ☐ Plugging
☐ Reconditioning Work ☐ Test

4. PROPOSED / PAST USE
☐ Domestic ☐ Irrigation ☐ Stock
☒ Municipal ☐ Industrial ☐ Test

5. DRILLING METHOD
☐ Rotary ☒ Rev. Rotary
☐ Cable ☐ Other

6. LOG

Material	From	To	Saturated ✓
Surface, Sand & clay	0	50	
Sand and Gravel	50	69	X

7. NEW WELL CONSTRUCTION DATA

Dates: Started March 29, 1981 Completed March 30, 1981
Contractor Hemphill Corporation
Driller Henkle Drilling & Supply Co., Inc.
Diameter Hole 18 in. Total Depth 69 ft.

CASING RECORD

Diameter	From	To
8 5/8 in.	0 ft.	69 ft.
in.	ft.	ft.

Surface Seal: ☒ Yes ☐ No Type: Cement Grout
Depth of Seal: 10 ft.
Gravel Packed: yes
Gravel Packed From 10 ft. to 69' ft.
Amount Used: 4 ton

PERFORATION RECORD

Type S. S. Continuour Slot From 54 ft. To 69 ft.
Size 8 5/8 From ft. To ft.
" From ft. To ft.

8. WELL TEST DATA

Hemphill Corporation tested well & installed pump.
Static Water Level Below Land Surface ft.
If Artesian: Flows gpm.
Water Temp °c/f Quality

BAILER TEST

Drawdown ft. After Pumping hrs. At gpm.
Size of Bailer: gal.

PUMPING TEST

Drawdown ft. After Pumping hrs. At gpm.

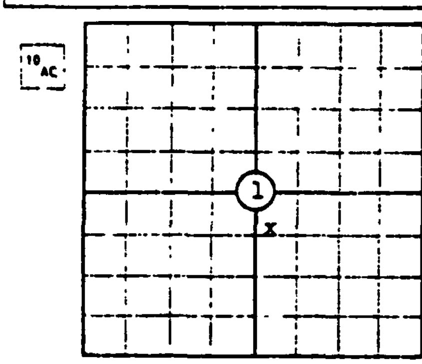
9. PLUGGING DATA

Date Plugged
Backfilled With Material To ft.
Grouted or Cemented From ft. To ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

10. RECONDITIONING WORK

Date Completed
☐ Replaced Casing From ft. To ft.
☐ Replaced Screen From ft. To ft.
Deepened Well From ft. To ft.
Redeveloped Well By

11. PLAT



NW ¼ of NW ¼ of SE ¼ of SEC 1 ;
TWP 12 N S. RGE 5 EIM WIM ECM

12. PUMP INFORMATION

Pump Type
Power Source
Rated Capacity gpm
Depth of Bowls or Cylinder ft

13. CERTIFICATION

The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Henkle Drilling & Supply Co. License # W. D. 120
Address Box 639 Garden City, Ks. 67846 Phone # 316-277-2389
Signed [signature] Date July 2, 81

00038

USE ADDITIONAL SHEETS IF NECESSARY

White — Water Resources Board
Canary — Drillers Copy
Pink — Drillers Copy

MULTI-PURPOSE WATER WELL REPORT

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N.E. 10th St., P.O. Box 53585
Oklahoma City, Oklahoma 73152

Application No 35
Aquifer
Steam System Code
Use Code
County
(Official Use Only)

1. OWNER Oklahoma Mortgage Co. **ADDRESS** 5100 N. Brookline
Oklahoma City. Ok. **PHONE** 947-5761

2. LEGAL DESCRIPTION OF WELL Well #1 Lot 14 NE Corner
EIM (Circle One)
SE ¼ of NE ¼ of SE ¼ of sec. 13 ; TWP. 12 N S, RGE 5 WIM ECM; COUNTY Canadian

3. TYPE OF WORK
- [x] New Well
- [ ] Plugging
- [ ] Reconditioning Work
- [ ] Test/Monitoring

4. USE
- [x] Domestic
- [ ] Stock
- [ ] Test Monitoring

NON-DOMESTIC
- [ ] Irrigation
- [ ] Municipal
- [ ] Industrial
- [ ] Commercial
- [ ] Other

5. DRILLING METHOD
- [x] Rotary
- [ ] Rev. Rotary
- [ ] Cable
- [ ] Other
- [ ] Air

6. LOG

Material	From	To	Saturated
Clay Shale	0	20	
Shale	20	40	
Shale	40	60	
Shale into water some	60	80	
Shale	80	100	
Water shale	100	120	
water shale water	120	140	
Shalw & Watersand	140	160	
Shale & Water	160	180	

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Water Resources

7. LOCATION PERMIT
If this well is Non-Domestic, has this location been permitted?
- [ ] Yes
- [ ] No

Permit No.

8. NEW WELL CONSTRUCTION DATA
DATES: Started May 20, 85 Completed May 20, 85
Contractor Poindexter Supply
Driller David poindexter
Diameter Hole 4 ½ in. Total Depth 180 ft.

CASING RECORD

	Diameter	From	To
Inside	4½ in.	0 ft.	180 ft.
Outside	in.	ft.	ft.

Cement Grout Surface Seal [x] Yes [ ] No
Type of Surface Seal steel & Cement Depth of Seal: 10 ft.
GRAVEL PACKED:
Gravel Packed From 0 ft. to 170 ft.
Amount Used: ALL

PERFORMATION RECORD

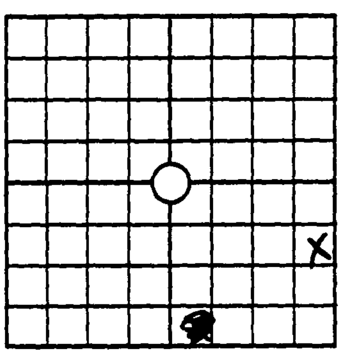
Type/Size	From	To
Slot 4½	80 ft.	90 ft.
	110 ft.	120 ft.
	140 ft.	150 ft.
	170	180

9. WELL TEST DATA
Static Water Level Below Land Surface 70 ft.
If Artesian: Flows gpm.
Approximate Yield 20 gpm.

10. PLUGGING DATA
Date Plugged
Backfilled With Material To ft.
Grouted or Cemented From ft. To ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

11. PLAT

10 AC.



SE ¼ of NE ¼ of SE ¼ of SEC 13 ;
TWP 12 N S; RGE 5 EIM WIM ECM (Circle One)

12. PUMP INFORMATION
Pump Type
Power Source
Rated Capacity gpm.
Depth of Bowls or Cylinder ft.

13. RECONDITIONING WORK
Date Completed
- [ ] Replaced Casing From ft. To ft.
- [ ] Replaced Screen From ft. To ft.

Deepened Well From ft. To ft.
Redeveloped Well By

14. CERTIFICATION
The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.
Name Poindexter Supply License # WD33
Address 4610 NW 10th OKC OK Phone # 943-3804
Signed [signature] Date

USE ADDITIONAL SHEETS IF NECESSARY

00040

White — Water Resources Board
Canary — Drillers Copy
Pink — Drillers Copy

MULTI-PURPOSE WATER WELL REPORT

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N.E. 10th St., P.O. Box 53585
Oklahoma City, Oklahoma 73152

Application No. 36
Aquifer
Steam System Code
Use Code
County
(Official Use Only)

1. OWNER Oklahoma Mortgage Company ADDRESS 5100 N. Brookline
Oklahoma City Okla. PHONE 947-5761

2. LEGAL DESCRIPTION OF WELL Well #2 Lot 5 NW corner
SE ¼ of NW ¼ of SE ¼ of sec. 13, TWP. 12 N S, RGE 5 EIM (Circle One) WIM ECM; COUNTY Canadian

3. TYPE OF WORK
☒ New Well ☐ Plugging
☐ Reconditioning Work
☐ Test/Monitoring

4. USE
☒ Domestic
☐ Stock
☐ Test Monitoring

NON-DOMESTIC
☐ Irrigation
☐ Municipal
☐ Industrial
☐ Commercial
☐ Other

5. DRILLING METHOD
☒ Rotary ☐ Rev Rotary
☐ Cable ☐ Other
X☐ Air

6. LOG

Material	From	To	Saturated
Soft wet clay	0	20	
Soft wet clay	20	30	
Shale	30	40	
Shale Water	40	60	
Shale & Water	60	80	
Shale & Water	80	100	
Shale	100	120	
Shale & Water	120	180	

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JUL 11 1985
Okla. Water Resources Board

7. LOCATION PERMIT
If this well is Non-Domestic, has this location been permitted?
☐ Yes ☐ No Permit No

8. NEW WELL CONSTRUCTION DATA
DATES: Started May 20, 85 Completed May 20, 85
Contractor Poindexter Supply
Driller David Poindexter
Diameter Hole 4½ in. Total Depth 180 ft.

CASING RECORD

	Diameter	From	To
Inside	4½ in.	0 ft.	180 ft.
Outside	in.	ft.	ft.

Cement Grout Surface Seal ☒ Yes ☐ No
Type of Surface Seal steel & cement Depth of Seal: 10 ft.
GRAVEL PACKED:
Gravel Packed From ALL 0 ft. to 170 ft.
Amount Used:

PERFORATION RECORD

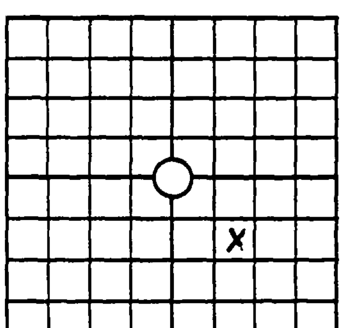
Type/Size	From	To
4½	80 ft.	90 ft.
	110 ft.	120 ft.
	140 ft.	150 ft.
	170	180

9. WELL TEST DATA
Static Water Level Below Land Surface 15 ft.
If Artesian: Flows gpm.
Approximate Yield 30 gpm.

10. PLUGGING DATA
Date Plugged
Backfilled With Material To ft.
Grouted or Cemented From ft. To ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

11. PLAT

10 AC.



SE ¼ of NW ¼ of SE ¼ of SEC 13;
TWP 12 N S; RGE 5 (Circle One) EIM WIM ECM

12. PUMP INFORMATION
Pump Type
Power Source
Rated Capacity gpm.
Depth of Bowls or Cylinder ft.

13. RECONDITIONING WORK
Date Completed
☐ Replaced Casing From ft. To ft.
☐ Replaced Screen From ft. To ft.
Deepened Well From ft. To ft.
Redeveloped Well By

14. CERTIFICATION
The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.
Name Poindexter Supply License # WD33
Address 4610 NW 10th OKC OK Phone # 943-3804
Signed [signature] Date 25 May 85

00041

Form 424-0684 USE ADDITIONAL SHEETS IF NECESSARY

White — Water Resources Board
Canary — Drillers Copy
Pink — Drillers Copy

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N E 10th St, P O Box 53585
Oklahoma City Oklahoma 73152

Application No
Aquifer
Steam System Code
Use Code
County
(Official Use Only)

MULTI-PURPOSE WATER WELL REPORT

1 OWNER Okla Mortgage Co. ADDRESS 5100 Brooklin
Suite 900, Okla City 73112 PHONE 947-5741

2 LEGAL DESCRIPTION OF WELL
SW ¼ of SE ¼ of SE ¼ of sec. 13 ; TWP. 12 N S. Rge. 5 EIM WIM ECM; COUNTY Canadian

3. TYPE OF WORK
☒ New Well ☐ Plugging
☐ Reconditioning Work ☐ Test

4. PROPOSED / PAST USE
☒ Domestic ☐ Irrigation ☐ Stock
☐ Municipal ☐ Industrial ☐ Test

5. DRILLING METHOD
☒ Rotary ☐ Rev. Rotary
☐ Cable ☐ Other

6. LOG

Material	From	To	Saturated ✓
Clay - shale	0	20	
Shale - little water	20	40	
shale	40	80	
water sand	80	180	

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7. NEW WELL CONSTRUCTION DATA

Dates: Started 27 Aug 84 Completed Same
Contractor Poindexter Supply
Driller DAVID
Diameter Hole 6 3/4 in. Total Depth 180 ft.

CASING RECORD

Diameter	From	To
4 ½ in.	0 ft.	180 ft.
in.	ft.	ft.

Surface Seal: ☒ Yes ☐ No Type: Shale & Cement
Depth of Seal: 10 ft.
Gravel Packed:
Gravel Packed From 10 ft. to 180 ft.
Amount Used: all

PERFORATION RECORD

Type Slot From 100 ft. To 110 ft.
Size 42 From 130 ft. To 140 ft.
" From 160 ft. To 180 ft.

8. WELL TEST DATA

Static Water Level Below Land Surface 100 ft.
If Artesian: Flows gpm.
Water Temp. °c/f Quality

BAILER TEST

Drawdown 130 ft. After Pumping hrs. At 25 gpm.
Size of Bailer: 17 gal.

PUMPING TEST

Drawdown ft. After Pumping hrs. At gpm.

9. PLUGGING DATA

Date Plugged
Backfilled With Material To ft.
Grouted or Cemented From ft. To ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

10. RECONDITIONING WORK

Date Completed
☐ Replaced Casing From ft. To ft.
☐ Replaced Screen From ft. To ft.
Deepened Well From ft. To ft.
Redeveloped Well By

11. PLAT

10 AC.

13

X

SW ¼ of SE ¼ of SE ¼ of SEC 13 ;
TWP 12 N S; RGE 5 EIM WIM ECM

12. PUMP INFORMATION

Pump Type
Power Source
Rated Capacity gpm.
Depth of Bowls or Cylinder ft.

13. CERTIFICATION

The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

Name Poindexter Supply License # WD-33
Address 2616 N. W. 10th OKC 73127 Phone # 943-3804
Signed [signature] Date 26 Aug 84

00043

White — Water Resources Board
Canary — Drillers Copy
Pink — Drillers Copy

MULTI-PURPOSE WATER WELL REPORT

STATE OF OKLAHOMA
WATER RESOURCES BOARD
1000 N.E. 10th St., P.O. Box 53585
Oklahoma City, Oklahoma 73152

Application No 39
Aquifer
Steam System Code
Use Code
County
(Official Use Only)

1. OWNER Oklahoma Mortgage **ADDRESS** 5100 N. Brookline
Oklahmma City Ok **PHONE** 947-5761

2. LEGAL DESCRIPTION OF WELL Well # 3 Lot 10 SW corner EIM (Circle One)
SW ¼ of SW ¼ of SE ¼ of sec. 13; TWP. 12 N; S; RGE 5 WIM ECM; **COUNTY** Canadian

3. TYPE OF WORK
- ☒ New Well
- ☐ Plugging
- ☐ Reconditioning Work
- ☐ Test/Monitoring

4. USE
- ☒ Domestic
- ☐ Stock
- ☐ Test Monitoring

NON-DOMESTIC
- ☐ Irrigation
- ☐ Municipal
- ☐ Industrial
- ☐ Commercial
- ☐ Other

5. DRILLING METHOD
- ☒ Rotary
- ☐ Rev. Rotary
- ☐ Cable
- ☐ Other
- ☒ Air

6. LOG

Material	From	To	Saturated
Soft clay Shale	0	20	
Shale	20	40	
Shale with water	40	60	
Water sand	60	80	
Water sand & Shale	80	100	
Shale with water	100	120	
Shale and water	120	140	
Water sand	140	160	
Water Shale Water	160	180	

RECEIVED
JUL 11 1985
Oklahoma Water Resources

7. LOCATION PERMIT
If this well is Non-Domestic, has this location been permitted?
☐ Yes ☐ No Permit No.

8. NEW WELL CONSTRUCTION DATA
DATES: Started 21 May 85 Completed 21 May. 85
Contractor Poindexter SUpply
Driller David Poindexter
Diameter Hole 4½ in. Total Depth 180 ft.

CASING RECORD

	Diameter	From	To
Inside	4½ in.	0 ft.	180 ft.
Outside	in.	ft.	ft.

Cement Grout Surface Seal ☒ Yes ☐ No
Type of Surface Seal: steel & cement Depth of Seal: 10 ft.
GRAVEL PACKED:
Gravel Packed From 0 ft. to 170 ft.
Amount Used: All

PERFORATION RECORD

Type/Size	From	To
Slot 4½	80 ft.	90 ft
	110 ft.	120 ft.
	140 ft.	150 ft.
	170	180

9. WELL TEST DATA
Static Water Level Below Land Surface 80 ft.
If Artesian: Flows gpm.
Approximate Yield 25 gpm.

10. PLUGGING DATA
Date Plugged
Backfilled With Material To ft.
Grouted or Cemented From ft. To ft.
Plot Location in Item 11. Show Distances From 2 Section Lines.

11. PLAT
10 AC.

SW ¼ of SE ¼ of SE ¼ of SEC 13;
TWP 12 N S; RGE 5 (Circle One) EIM WIM ECM

13. RECONDITIONING WORK
Date Completed
☐ Replaced Casing From ft. To ft.
☐ Replaced Screen From ft. To ft.
Deepened Well From ft. To ft.
Redeveloped Well By

12. PUMP INFORMATION
Pump Type
Power Source
Rated Capacity gpm.
Depth of Bowls or Cylinder ft.

14. CERTIFICATION
The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.
Name Poindexter Supply License # WD33
Address 4610 N.W. 10th OKC OK Phone # 943-3804
Signed [signature] Date 25 May 85

00044

Form 424-0684 USE ADDITIONAL SHEETS IF NECESSARY

OKD987070059

S1 References

REFERENCE 26 PART 5

SOIL SURVEY

Oklahoma County, Oklahoma

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
OKLAHOMA AGRICULTURAL EXPERIMENT STATION

Issued February 1969

SOIL SURVEY OF OKLAHOMA COUNTY, OKLAHOMA

BY CARL F. FISHER AND JOHN V. CHELF, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, IN COOPERATION WITH THE OKLAHOMA AGRICULTURAL EXPERIMENT STATION

OKLAHOMA COUNTY is in the central part of Oklahoma (fig. 1). It has a total land area of 705 square miles, or 451,200 acres. Oklahoma City is the county seat and the largest city in the State. Other towns are Arcadia, Edmond, Bethany, Harrah, and Nicoma Park. In 1960, the county had a population of 439,506, of which less than 1 percent lived on farms.

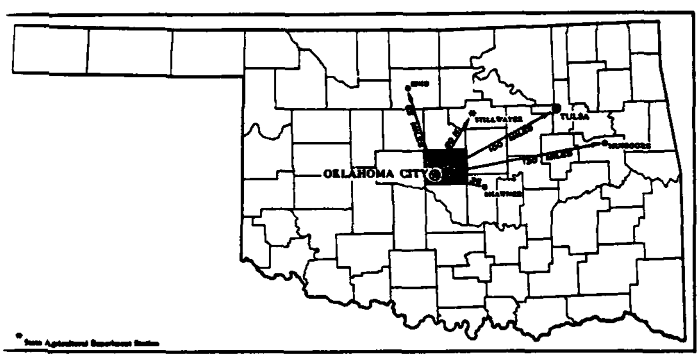


Figure 1.—Location of Oklahoma County in Oklahoma.

The county is part of the Central Lowland physiographic province. It has a subhumid climate, and an average annual rainfall of 31.93 inches. Elevations range from about 1,300 feet in the northwestern part to 850 feet in the southeastern part. Oklahoma City is 1,194 feet above sea level. The North Canadian River, the largest stream, flows across the county.

Homesteaders who came from the Northern States settled in the area that is now Oklahoma County after the area was opened in 1889. Farming was the main occupation and is still one of the principal sources of income. The main farm enterprises are the growing of small grains, mainly winter wheat, and the raising of livestock. Of the total farm income in 1964, the sale of livestock and livestock products accounted for about 65 percent and the sale of crops, about 35 percent. Most of the farmland in the eastern part of the county is in pastures of tame and native grasses. The western part of the county marks the eastern border of the main wheat-growing area of Oklahoma. In 1964, there were about 1,102 farms in Oklahoma County, and their average size was about 214 acres.

Most of the farmland in the county is on uplands consisting of loamy soils that are well drained or somewhat excessively drained. A considerable acreage is made up of loamy soils on bottom lands. Flooding is a hazard on some of the soils on bottom lands, though the total acreage of soils in the county that require drainage is relatively small. Also small is the acreage of clayey soils.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Oklahoma County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a farm or field, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect management.

The five soil associations in Oklahoma County are described briefly in this section. More information about the individual soils in each soil association can be obtained from the detailed soil map at the back of this survey and from the section "Descriptions of the Soils."

1. Darnell-Stephenville Association

Shallow and deep, gently sloping to strongly sloping, loamy soils on wooded uplands

This association consists of shallow and deep soils on wooded uplands in the eastern two-thirds of the county. These soils are mostly gently sloping to moderately sloping, but they are strongly sloping in places. This association covers about 177,000 acres, or about 45 percent of the farmland in the county. Figure 2 shows a typical area of soil association 1.

The Darnell soils make up about 56 percent of this association; the Stephenville soils, 31 percent; and minor soils, the remaining 13 percent. The chief minor soils are the closely intermingled Vernon and Lucien soils and the Noble, Konawa, and Dougherty soils.

The Darnell soils have a reddish-brown or brown surface layer that is generally fine sandy loam. The surface layer

Soils for Windbreaks and Post Lots." Behavior of the soils when used as sites for structures or as material for construction is discussed in the subsection "Use of Soils in Engineering."

Bethany Series

The Bethany series consists of deep, dark-colored, nearly level soils on uplands. These soils are in the northwestern and southwestern parts of the county.

In a typical profile, the surface layer is dark grayish-brown, slightly acid silt loam about 14 inches thick. This layer is of granular structure.

The subsoil is about 43 inches thick. It contains less clay and is less compact in its upper part than its lower part. The upper part is dark grayish-brown silty clay loam that has moderate, medium, subangular blocky structure. The lower part is brown light clay of strong to moderate, medium, blocky structure.

The underlying material is brown light clay that is mottled firm, limy, and difficult for plant roots to penetrate.

Bethany soils are naturally well drained. Internal drainage is medium, and permeability is slow. Water-holding capacity and natural fertility are high.

Almost all of the acreage of Bethany soils is cultivated. These soils are suited to small grains, sorghums, cotton, legumes, and grasses. Winter wheat is the crop most widely grown.

Typical profile of Bethany silt loam, 0 to 1 percent slopes, in a cultivated field (east side of road, about 1,000 feet north and 100 feet east from the southwest corner of section 28, T. 11 N., R. 4 W.):

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) when moist; weak, fine, granular structure; slightly hard when dry, friable when moist; slightly acid; clear boundary; horizon 6 to 10 inches thick.

A12—6 to 14 inches, dark grayish-brown (10YR 4/2) heavy silt loam, very dark grayish brown (10YR 3/2) when moist; moderate, medium, granular structure; slightly hard when dry, friable when moist; slightly acid; clear boundary; horizon 5 to 10 inches thick.

B1—14 to 18 inches, dark grayish-brown (10YR 4/2) silty clay loam, dark brown (10YR 3/3) when moist; moderate, medium, subangular blocky structure; hard when dry, firm when moist; neutral; clear boundary; horizon 3 to 8 inches thick.

B2t—18 to 40 inches, brown (10YR 5/3) light clay, dark brown (10YR 4/3) when moist; strong, medium, blocky structure; very hard when dry, very firm when moist; thick, complete clay films on ped faces; mildly alkaline; gradual boundary; horizon 12 to 26 inches thick.

B3—40 to 57 inches, brown (10YR 5/3) light clay, dark brown (10YR 4/3) when moist; moderate, medium, blocky structure; very hard when dry, very firm when moist; moderately alkaline; many fine segregated concretions of calcium carbonate; iron and manganese pellets common; gradual boundary; horizon 15 to 20 inches thick.

C—57 to 64 inches +, brown (7.5YR 5/4) light clay with distinct common, fine and coarse mottles of reddish brown (5YR 4/4); dark brown (7.5YR 4/4) when moist; massive; very hard when dry, very firm when moist; calcareous.

The Ap and A12 horizons are silt loam in most places, but there is some loam in tilled areas. The A12 horizon ranges from dark grayish brown to dark brown in hues of 10YR and 7.5YR. The B2t horizon ranges from dark grayish brown to brown in a hue of 10YR. Its texture is heavy silty clay loam and light clay. Depth to the B2t horizon ranges from 14 to 24 inches.

Bethany soils have a more clayey B2t horizon than Vanoss and Chickasha soils.

Bethany silt loam, 0 to 1 percent slopes (BeA).—This soil has the profile described as typical for the Bethany series. It absorbs water well and releases it readily to crops. Tillage is moderately easy.

This is one of the most desirable soils in the county for small grains, and it is well suited to the other crops most commonly grown. All of it, except for a few small areas in native grass, is cultivated. Winter wheat is the main crop, but other small grains, sorghums, cotton, alfalfa, and grasses are also grown.

Management is needed for maintaining soil structure and fertility. All crop residue should be returned to the soil, but excessive tillage should be avoided. Small grains can be grown continuously if crop residues are returned to the soil and adequate fertilizer is applied. (Capability unit I-2; Loamy Prairie range site)

Breaks-Alluvial Land Complex

Breaks-Alluvial land complex (Bk) consists of small nonarable valleys cut into the smoother uplands along the upper reaches of intermittent streams. The sides of the valleys are sloping to steep. Areas of this complex range from 100 to 300 feet in width but are 50 to 150 feet wide in most places.

The soil material on the valley sides varies widely, but in most places is loamy in the surface layer and loamy to clayey in the subsoil and substratum. Color ranges from grayish brown and dark brown to reddish brown, depending on the color of associated soils in the surrounding uplands. Depth to bedrock of sandstone, shale, or both ranges from less than 10 inches to more than 5 feet but is greater than 3 feet in most places. The soil material in the valley floor is loamy, brown to reddish brown, and generally calcareous. Slopes dominantly range from 0 to 12 percent. The vegetation on the valley sides consists mostly of short grasses, though mid grasses grow in areas of the less clayey soils. In other areas, the vegetation on the valley sides consists mostly of tall grasses and some trees found in local areas. This land type is used mostly for permanent pasture. (Capability unit VIe-1; Breaks are in the Red Clay Prairie range site, and Alluvial land is in the Loamy Bottom Land range site)

Broken Alluvial Land

Broken alluvial land (Br) consists of reddish-brown, friable, loamy alluvium. It lies in a narrow strip along the sides of streams that have cut deep, wide channels. The banks average 10 feet in height, but the steep banks are 15 to 25 feet high. The stream channels range from 60 to 100 feet in width and are wider in the bends of the creeks. Slopes range from 2 to 20 percent.

This land supports a thick stand of trees, mainly elm, cottonwood, hackberry, and pecan. The undergrowth is mixed and includes some shrubs and tall grasses.

This land is suitable for native grasses used for grazing. It is also suitable as a habitat for wildlife.

Further erosion of streambanks can be controlled by avoiding overgrazing and clearing of trees and by prevent-

The soils in this group are generally unsuitable for field windbreaks or post lots. They are suitable for farmstead windbreaks where tall trees are not needed and where the trees can be watered in droughty periods with the water supplying the farm.

Trees suitable for farmstead windbreaks on the soils of this group are Siberian elm, Russian mulberry, eastern redcedar, and some strains of Chinese arborvitae. These trees grow much slower on the soils of this group than they do on those of groups 1 and 2. Also, more cultivation and more watering are needed.

WOODLAND SUITABILITY GROUP 4

The soils in this woodland suitability group range from shallow to deep and from nearly level to moderately steep. They are noneroded or severely eroded. These soils make up about 20 percent of the farmland in the county. In this group are Lela and Miller soils, Darnell-Stephenville, Miller-Slickspots, and Vernon-Lucien complexes, and Eroded clayey land and Eroded loamy land.

These soils are not suitable for tree plantings in windbreaks or post lots. The survival and growth of trees are limited by many adverse characteristics, mainly salinity, erosion, and shallowness.

Wildlife and Fish[4]

The main areas of wildlife habitat in Oklahoma County are the prairies, the timbered uplands, and the timbered bottom lands. The prairies are in the western one-third of the county, and the timbered uplands are in the eastern two-thirds. The timbered bottom lands occur as narrow bands on both sides of the North Canadian River and Deep Fork. They are also along other large streams and along some drainageways.

Important kinds of wildlife in the county are bobwhite quail, mourning dove, fox squirrel, deer, cottontail and jack rabbit, mink, opossum, skunk, muskrat, and beaver. Small flocks of Rio Grande wild turkey have been released in the county and appear to be successfully established. Predatory animals include coyote, bobcat, red fox, and gray fox. Predatory birds are mostly many kinds of hawks and owls. They are protected by law because they help to control harmful rodents. The large lakes in the county attract waterfowl during the migration season. Many kinds of songbirds live in the county during all seasons. They are protected because of their esthetic value and because they help control some of the harmful insects.

Where habitat is adequate and reproduction of wildlife is normal, most kinds of game can be hunted each year and still maintain their numbers. Bobwhite quail is the most popular game bird. Mourning dove is hunted in stubble fields, in weed fields, and around ponds, but the number of dove taken is limited. These birds migrate locally because the weather is warm during the hunting season. Squirrel hunting is popular in the more heavily wooded areas. Coyote are hunted for sport, but only a few pelts are sold. A few opossum, skunk, muskrat, and mink are trapped for their pelts. Mink is the most valuable furbearer in the county. Hunting waterfowl is important around Lake Hefner and around some of the farm ponds that contain food plants.

[4] By JEROME F. SYKORA, biologist, Soil Conservation Service.

Fish in the larger streams include black and white bass, channel, bullhead, and flathead catfish, crappie, carp, buffalo, and species of small sunfish and of minnows. Also, fish have been stocked in many farm ponds and in lakes that have been built for watering livestock and for recreation (fig. 12). A moderate to large amount of bass and channel catfish can be produced where drainage is from a well-vegetated watershed, water is fertile, and a reasonably stable water level is maintained. Most fishing in the county is in Hefner, Overholser, and Hiwassee Lakes and in farm ponds. Bass, bluegill, and channel catfish for stocking suitable ponds are available from Federal and State fish hatcheries.

A convenient way to discuss different kinds of wildlife habitat in the county is by soil associations. The soil associations in this county are described in the section "General Soil Map."

The Darnell-Stephenville association (1) makes up about 45 percent of the farmland in the county. Because of the strong slopes and low fertility, only about 30 percent of the acreage is cultivated. Much of the area is covered with dense stands consisting of post oak, blackjack oak, and oak and hickory. Many areas that were formerly cultivated have reverted naturally to grasses or have been reseeded or sodded. Other areas have been invaded by trees and shrubby vegetation.

The varied plant cover of soil association 1 provides a good habitat for bobwhite quail, deer, furbearers, and other wildlife. Many areas can be easily managed so as to increase the number of wildlife. Some of the practices needed are selective clearing of brush, seeding of plants for wildlife food, and disturbing the soils so as to increase weeds. The closely intermingled Vernon and Lucien soils are not suitable for planting trees and shrubs, but they can be improved as wildlife habitat if they are disked or otherwise disturbed. Grazing of livestock needs to be controlled in this association so that enough cover is left for birds that nest on the ground.

The Renfrow-Vernon-Bethany association (2) makes up about 24 percent of the farmland in the county. Because most of this acreage is cultivated, only a few areas of food and cover are available for wildlife. Wheat is the main crop, and its stubble provides food for mourning doves during a short period in summer. Migrating geese feed on fall-planted wheat. Deer and bobwhite quail feed on the wheat that is adjacent to their cover, which is generally along streams and drainageways. Trees and shrubs can be planted to create wildlife habitat, or to supplement that existing, if the more permeable soils in this association are selected. These plantings must be cultivated and protected until they are established.

The Dale-Canadian-Port association (3) makes up about 16 percent of the farmland in the county. Intensive cultivation of the deep, fertile soils on benches has eliminated much of the desirable wildlife habitat, though some remain in parts of the flood plains that are not desirable for cultivation. The soils of this association are well adapted to many kinds of plantings for wildlife. Because these soils are deep and fertile and are subirrigated in places, plants grow rapidly and produce seed early.

The Dougherty-Norge-Teller association (4) makes up about 9 percent of the farmland in the county. About half of the acreage is cultivated, and the rest is in native grass, is pastured, is idle, or is in many kinds of woody plants.

TABLE 4.—*Engineerin*

Soil series and map symbol [1]	Suitability as source of—			Soil features affecting—
	Topsoil	Select material	Road fill	Highway location
Bethany (BeA)	Good to fair to a depth of 1½ feet: Easily eroded on steep slopes.	Unsuitable	Poor: Moderate shrink-swell potential; unstable.	Moderate shrink-swell potential; very slow internal drainage; unstable.
Breaks-Alluvial land (Bk)	Poor: Limited quantity of material.	Poor: Inaccessible and too clayey.	Poor: Limited quantity of material; unstable.	Broken topography; unstable; highly plastic.
Broken alluvial land (Br)	Fair: Broken and on steep slopes; limited material.	Poor: Variable material	Poor: Low density; difficult to compact.	Broken topography; unstable when wet; frequently flooded.
Canadian (Ca)	Poor: Easily eroded on steep slopes.	Good	Good	Features favorable
Canadian-Dale (CdB)	Poor to good: Areas must be selected.	Unsuitable to good: Areas must be selected.	Poor to good: Selective borrow must be used.	Weak foundation in Dale soil.
Chickasha (ChB)	Good	Poor: Elastic material	Good to fair	Features favorable
Crevasse (Cr, Cv)	Poor: Too sandy	Good to fair: Lacks binder in some places.	Good if confined and slopes are stabilized.	Frequent flooding
Dale (Dl)	Good	Unsuitable: Too clayey	Poor: Unstable	Nearly level slopes; weak foundation.
Darnell-Stephenville (DsE, DtE3).	Poor: Limited quantity; easily eroded.	Good but limited in quantity.	Good but limited in depth to sandstone.	Sandstone at a depth of 1 to 4 feet.
Dougherty (DuC)	Poor: Low fertility; easily eroded.	Good	Good if entire profile is used.	Erodible soils
Eroded clayey land (Es)	Poor: Shallow, clayey material.	Unsuitable: Too clayey.	Poor: High shrink-swell potential; unstable.	Some steep slopes; highly plastic; numerous gullies.
Eroded loamy land (Et)	Poor: Low fertility	Unsuitable: Clay loam areas are too plastic.	Poor: Unstable	Some steep slopes; material unstable when wet.
Grant (GrB)	Fair: Easily eroded on steep slopes.	Poor: Highly elastic	Poor: Requires close control of moisture; unstable.	Unstable slopes; requires good drainage in foundation.
Konawa (KoB)	Poor: Low fertility; easily eroded.	Good	Good if entire profile is used.	Erodible soils
Lela (Lc)	Poor: Too clayey	Unsuitable: Highly plastic.	Very poor: Highly plastic; high volume change; unstable.	Highly plastic clay; poor drainage.

See footnote at end of table

...on of soils

Soil features affecting— Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
...voir area	Embankment				
...favorable	Susceptible to cracking when dry; low shear strength.	Good drainage	Slow rate of intake; slow permeability.	Susceptible to ponding in channels.	Features favorable.
...depth; possible seepage at abutment.	Shallow soil in some places; cracks when dry.	Good to excessive drainage.	Broken topography; nonarable land.	Broken topography; nonarable land.	Broken topography; nonarable land.
Flooding; broken topography.	Flooding; broken topography.	Frequent flooding	Frequent flooding; broken topography.	Frequent flooding; broken topography.	Frequent flooding; broken topography.
High rate of potential seepage; nearly level topography.	High rate of potential seepage; high erodibility.	Good drainage	Features favorable	Nearly level topography.	Nearly level topography.
High rate of potential seepage; nearly level topography.	Features favorable	Good drainage	Variable rate of intake.	Nearly level topography.	Nearly level topography.
Features favorable	Features favorable	Good drainage	Features favorable	Features favorable	Features favorable.
Sandy material; high water table.	High rate of seepage.	Frequent flooding	Frequent flooding; low water-holding capacity; high rate of intake.	Nonarable soils; frequent flooding.	Nonarable soils; frequent flooding.
Features favorable for dug ponds.	Features favorable	Good drainage	Features favorable	Nearly level topography.	Nearly level topography.
Sandstone at a depth of 1 to 4 feet; high rate of seepage.	High rate of potential seepage and limited amount of material.	Good drainage to excessive.	Strong slopes; variable depths.	Shallow soils over sandstone.	Shallow, droughty soils.
High rate of seepage.	High erodibility	Good drainage	Wind erosion; hummocky topography.	Hummocky topography; subject to wind erosion.	Soils subject to wind and gully erosion.
Depth to shale may be limited.	Unstable material; cracks when dry.	Good drainage	Nonarable land; severely eroded.	Nonarable land, severely eroded.	Vegetation hard to establish; little topsoil; numerous gullies.
Features favorable	Features favorable	Good drainage	Severely eroded land.	Nonarable land; severely eroded.	Severely eroded land.
Features favorable	Features favorable	Good drainage	Features favorable	Features favorable	Features favorable.
High rate of seepage.	High erodibility	Good drainage	Undulating topography; wind erosion.	Susceptible to wind erosion.	Susceptible to wind and gully erosion.
Features favorable for dug ponds.	Low stability; subject to severe cracking.	Somewhat poor drainage; very slow internal drainage.	Very slow rate of intake; very slow permeability; subject to severe cracking.	Nearly level topography.	Nearly level topography when dry.

REFERENCE 27

RECORD OF COMMUNICATION

Reference 27

TYPE: Telephone Call **DATE:** 5-17-91 **TIME:** 3:30 p.m.

TO:
Kevin Jaynes
FIT Biologist
ICF Technology, Inc.
Dallas, Texas
214-744-1641

FROM:
Dan Bridgeforth
Superintendent
City of Bethany
Bethany, Oklahoma
405-789-0920

SUBJECT: City of Bethany Wells Info. and Numbering System.

SUMMARY OF COMMUNICATION

Mr. Bridgeforth returned my call. I explained to him of the U.S.G.S. database dumpout I had received from Scott Christianson concerning the Garber Wellington Aquifer and the wells located in Township 12-N, Range 4-W. I explained that U.S.G.S. had a fifteen digit code identifying the well and then a summary of its water quality. I needed to cross reference these codes to find the city of Bethany wells. Mr. Bridgeforth said he could do this if I sent Him the information. Mr. Bridgeforth was familiar with the previous FIT work around WPA and asked for the reports on the Air Center. I referred him to the EPA FOI Officer and address.

Mr. Bridgeforth continued to explain that the Bluff Creek Canal actually runs from the south to the north and that a smaller intermittent stream just east of the canal received the run-off from WPA. This stream runs south to Lake Overholser. The Bluff Canal runs from Overholser to Lake Hefner.

REFERENCE 28

RECORD OF COMMUNICATION	[X] Phone Call [ ] Discussion [ ] Field Trip [ ] Conference [ ] Other (Specify) Ref. 22	
TO: Mr. Doug Moore President Woodlake Homeowners Association OK City (405) 686-2613	FROM: Ravinder Joseph (214) 744-1641	DATE: 9/16/88 TIME: 1345

SUBJECT: Woodlake Pond

SUMMARY OF COMMUNICATION:

Mr. Moore said that Woodlake pond is a perennial pond with a circumference of approximately 4/10 of a mile. He estimates the depth to be between 16' to 20'. He also mentioned that the lake has never been dredged.

CONCLUSIONS, ACTION TAKEN OR REQUIRED:

INFORMATION COPIES TO:

EPA FORM 1300-6 (7-72)
Replaces EPA HQ Form 5300-3 Which May Be Used Until Supply is Exhausted.

REFERENCE 29

RECORD OF COMMUNICATION

[X] Phone Call	[ ] Discussion	[ ] Field Trip
[ ] Conference	[ ] Other (Specify)	

Ref. 21

TO:	FROM:	DATE:
Mr. Bob Myer	Ravinder Joseph	9/16/88
Planning & Development, OK City (405) 231-2287	(214) 744-1641	TIME: 1515

SUBJECT: Ski Island Lake and Silver Lake

SUMMARY OF COMMUNICATION:

Ski Island Lake and Silver Lake are used for fishing, swimming and boating. They are fed by spring creek and are connected by a spill way.

CONCLUSIONS, ACTION TAKEN OR REQUIRED:

INFORMATION COPIES TO:

EPA FORM 1300-6 (7-72)
Replaces EPA HQ Form 5300-3 Which May Be Used Until Supply is Exhausted.

REFERENCE 30

RECORD OF COMMUNICATION

TYPE: Telephone Call **DATE:** 6-27-91 **TIME:** 9:30 a.m.

TO: Patrick Yonikas
OKC Water Dept.
Oklahoma City, Oklahoma
405-297-3811

FROM: Kevin Jaynes
FIT Biologist
ICF Technology, Inc.
Dallas, Texas
214-744-1641

SUBJECT: Oklahoma City Reservoirs and Water Supply

SUMMARY OF COMMUNICATION

Mr. Yonikas stated that the North Canadian River supplys both Lake Overholser and Lake Hefner. This is controlled by a series of flood gates along the river. When Overholsr is to be filled, gates are set to divert flow in , vice-versa for Lake Hefner; the Bluff Creek Canal is flooded to fill Lake Hefner.

The intakes are located at the far northern end of Lake Hefner at the dam and the other at the far southeastern end of Lake Overholser where the North Canadian River exits. Average usage is 80 million gallons a day (mgd) including Lake Draper. Total population served is 460,000 including Draper.

Lake Overholser is used for drinking water only in the summertime.

Average usage for Lake Overholser is 12 mgd and for Hefner is 25 mgd. Approximately 60% of water usage is from the North Canadian via these two lakes.

OKC sells water to all other rural districts and does so at peak times of usage.

Bluff Creek Canal is mostly concrete lined, runs northward to Hefner and has a capacity of 1500 Cubic Feet Per Second (cfs). It has been designed to eliminate most serious runoff into it except what is diverted from the North Canadian River at the flood control gates.

REFERENCE 31

RECORD OF COMMUNICATION Reference 31

TYPE: Telephone Call **DATE:** 6-27-91 **TIME:** 10:40 a.m.

TO:
John Skeen
Biologist
Oklahoma Wildlife
Conservation Department
OKC, Oklahoma
405-521-3851

FROM:
Kevin Jaynes
FIT Biologist
ICF Technology, Inc.
Dallas, Texas
214-744-1641

SUBJECT: Stinchcomb Wildlife Refuge and Critical Habitats.

SUMMARY OF COMMUNICATION

Mr. Skeen indicated that there are no critical habitats in Oklahoma County.

The Stinchcomb Wildlife Refuge is not a federally or state designated area, it is however an important area for birds and often Least Terns are spotted foraging the area.

Another important area which is privately owned is the Rose Lake area located at N.W. 50th and Sara Road. This area is 100 to 200 acres and is important for Least Terns and other migratory birds.

REFERENCE 32

RECORD OF COMMUNICATION

Reference 32

TYPE: Telephone Call **DATE:** 6-27-91 **TIME:** 9:00 a.m.

TO: Ken Morris Oklahoma Water Resources Board Oklahoma City, Oklahoma 405-231-2533	**FROM:** Kevin Jaynes KJ FIT Biologist ICF Technology, Inc. Dallas, Texas 214-744-1641

SUBJECT: Lake Overholser, Lake Hefner and Stinchcomb Wildlife Refuge.

SUMMARY OF COMMUNICATION

Mr. Morris indicated that Bluff Creek Canal runs north to Lake Hefner but as far as intakes for the reservoirs, the FIT would have to call the city water resources at 405-297-2533 and talk to Mr. Paul Brum. Mr. Morris stated that they deal on a state level for floodplain management. Mr. Morris indicated that WPA is situated in a Zone C outside of a 500 year floodplain according to FEMA insurance map.

Mr. Morris stated that the Stinchcomb Wildlife Refuge is not a federal sanctioned wetland but is considered a wetland. I would have to call the Oklahoma Wildlife and Fisheries Department for that info.

REFERENCE 33

DEPARTMENT OF COMMERCE
HODGES, Secretary

WEATHER BUREAU
F. W. REICHELDERFER, Chief

TECHNICAL PAPER NO. 40

RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years

Prepared by
DAVID M. HERSHFIELD
Cooperative Studies Section, Hydrologic Services Division
for
Engineering Division, Soil Conservation Service
U.S. Department of Agriculture

WASHINGTON, D.C.
May 1961

NOTICE

Rainfall-frequency information for durations of 1 hour and less for the Central and Eastern States has been superseded by NOAA Technical Memorandum NWS HYDRO-35 Five to Sixty-Minute Precipitation Frequency for the Eastern and Central United States. This publication (Accession No. PB 272-112/AS) is obtainable from:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161

THIS ATLAS IS OBSOLETE FOR THE FOLLOWING 11 WESTERN STATES: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

NOAA ATLAS 2: PRECIPITATION-FREQUENCY ATLAS OF THE WESTERN UNITED STATES (GPO: 11 Vols., 1973) supersedes the Technical Paper 40 data for these states.

All but 3 of the 11 state volumes are out of print, and no reprint is presently planned.

Institutions in the eleven western states likely to have copies of these volumes for their state for public inspection are:

- US Department of Agriculture Soil Conservation Service Offices
- US Army Corps of Engineers Offices
- Selected University Libraries
- National Weather Service Offices (may also have volumes for adjacent states).
- National Weather Service Forecast Offices (may have all eleven volumes)

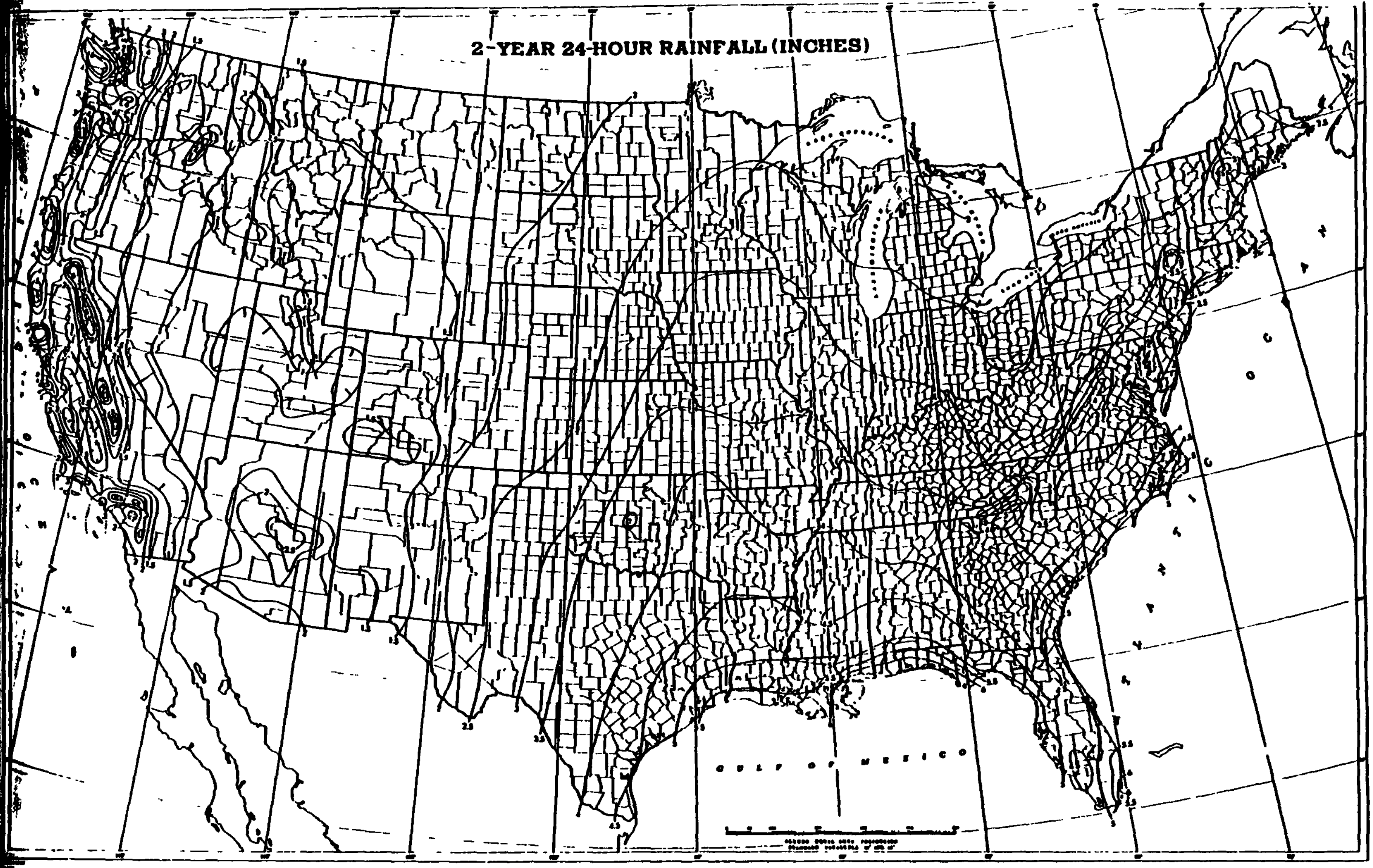
Elsewhere, libraries of universities where hydrology and meteorology degree programs are offered may shelve some of the eleven volumes.

The three volumes in print as of 1 Jan 1983 at the GPO are:

Vol	State	GPO Stock Number	Price
IV	New Mexico	003-017-00158-0	$10.00
VI	Utah	003-017-00160-1	12.00
VII	Nevada	003-017-0016[illegible]	[illegible].50

The GPO order number is 202 [illegible] for VISA and MASTERCARD orders which [illegible]

8011


2-YEAR 24-HOUR RAINFALL (INCHES)
GULF OF MEXICO

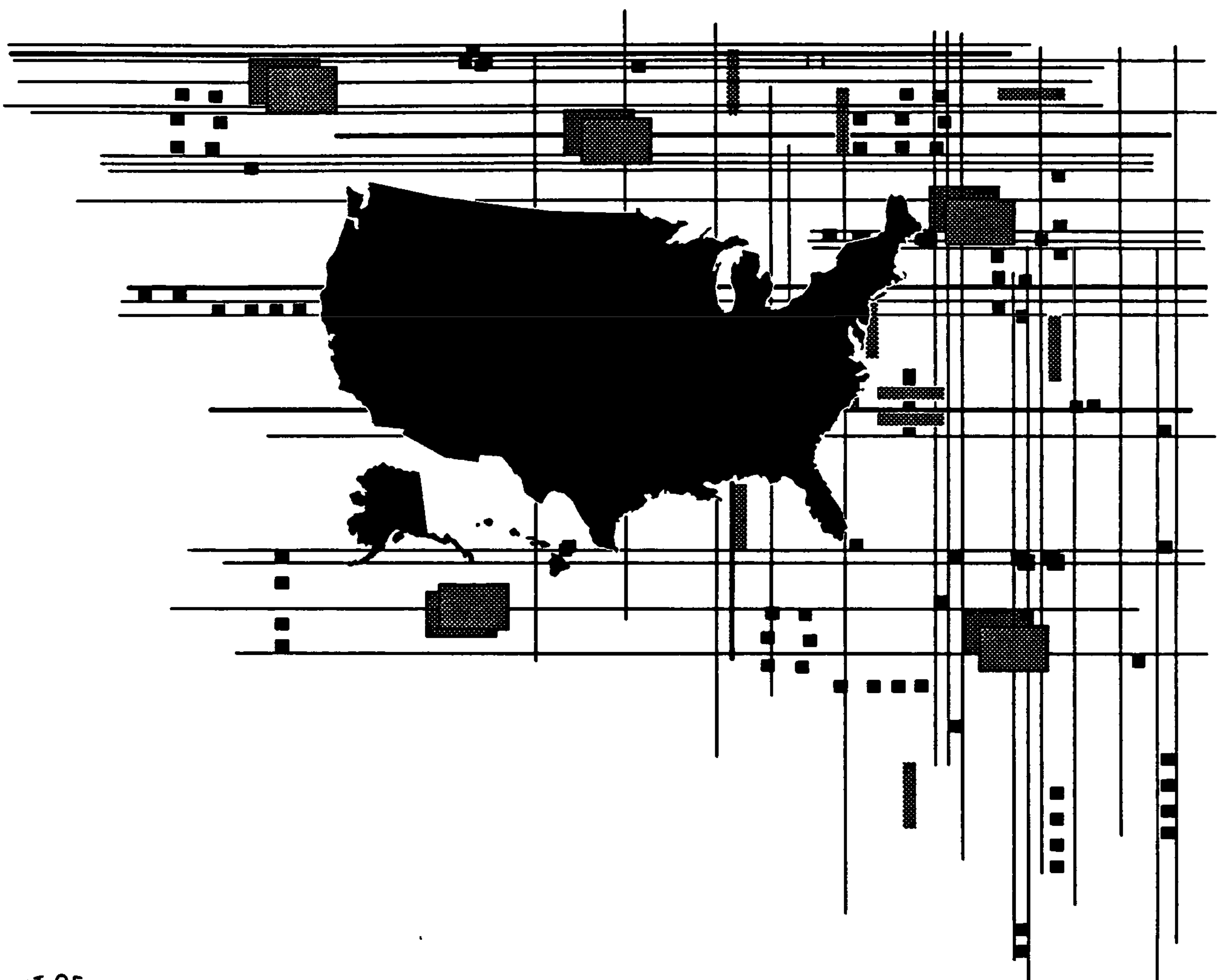
REFERENCE 34

CURRENT POPULATION REPORTS

Special Studies

Series P-23, No. 156

Estimates of Households, for Counties: July 1,1985



U.S. Department of Commerce
BUREAU OF THE CENSUS

Table 1. Estimates of Households, for Counties: July 1, 1985—Continued

(A dash (-) represents zero or rounds to zero. Estimates are consistent with special censuses since 1980. Corrections to 1980 census counts are not included. See text concerning rounding and average population per household)

State and county	Households				Average population per household		Population			
	July 1, 1985 (estimate)	April 1, 1980 (census)	Change, 1980-85		July 1, 1985 (estimate)	April 1, 1980 (census)	July 1, 1985 (estimate)	April 1, 1980 (census)	Change, 1980-85	
			Number	Percent					Number	Percent
Oklahoma—Continued										
Garvin	11,400	10,511	900	8.9	2.53	2.55	30,000	27,856	2,200	7.7
Grady	16,300	14,302	2,000	13.8	2.72	2.71	45,000	39,490	5,500	14.0
Grant	2,600	2,656	-	-0.8	2.48	2.41	6,600	6,518	100	2.0
Greer	2,900	2,868	-	1.2	2.26	2.28	7,000	7,028	-	0.3
Harmon	1,800	1,758	-	1.4	2.43	2.47	4,500	4,519	-	-0.3
Harper	2,000	1,905	100	3.2	2.39	2.44	4,800	4,715	-	0.9
Haskell	4,700	4,191	500	12.5	2.51	2.61	11,900	11,010	900	8.5
Hughes	5,700	5,588	100	1.9	2.54	2.53	14,700	14,338	400	2.7
Jackson	11,600	10,543	1,000	9.7	2.61	2.77	31,200	30,356	800	2.8
Jefferson	3,200	3,174	-	0.9	2.48	2.53	8,100	8,183	-100	-0.7
Johnston	4,200	3,831	400	10.2	2.50	2.61	10,900	10,356	500	5.2
Kay	20,800	19,431	1,400	7.0	2.48	2.51	52,800	49,852	2,900	5.8
Kingfisher	5,900	5,161	700	13.5	2.73	2.72	16,100	14,187	1,900	13.6
Kiowa	5,200	5,042	100	2.4	2.41	2.48	12,700	12,711	-	-0.3
Latimer	3,700	3,398	300	7.8	2.69	2.71	10,400	9,840	600	5.6
Le Flore	16,100	14,484	1,600	11.0	2.68	2.75	44,000	40,698	3,300	8.0
Lincoln	11,000	9,649	1,400	14.4	2.70	2.73	30,100	26,601	3,500	13.2
Logan	10,700	9,414	1,300	14.2	2.72	2.70	31,100	26,881	4,200	15.6
Love	3,100	2,834	300	10.7	2.54	2.64	8,000	7,469	500	6.7
McClain	8,800	7,066	1,700	23.9	2.79	2.84	24,700	20,291	4,400	21.5
McCurtain	12,800	12,366	400	3.2	2.82	2.89	36,500	36,151	300	0.9
McIntosh	7,000	5,935	1,100	17.9	2.45	2.57	17,500	15,562	2,000	12.5
Major	3,500	3,272	200	6.4	2.64	2.65	9,300	8,772	500	6.0
Marshall	4,600	4,158	400	10.8	2.46	2.49	11,500	10,550	1,000	9.3
Mayes	12,600	11,622	1,000	8.6	2.73	2.72	35,200	32,261	2,900	9.0
Murray	4,900	4,537	400	8.2	2.55	2.57	13,100	12,147	900	7.7
Muskogee	26,500	24,736	1,700	7.1	2.60	2.64	70,600	66,939	3,700	5.5
Noble	4,500	4,348	200	3.7	2.57	2.60	11,900	11,573	300	2.6
Nowata	4,300	4,327	-100	-1.6	2.59	2.61	11,200	11,486	-300	-2.5
Okfuskee	4,300	4,127	200	4.3	2.63	2.62	11,700	11,125	500	4.8
Oklahoma	253,200	220,580	32,600	14.8	2.45	2.54	631,200	568,933	62,300	11.0
Okmulgee	15,000	14,314	700	4.6	2.55	2.61	40,000	39,169	800	2.1
Osage	15,100	14,382	700	4.7	2.69	2.68	41,300	39,327	1,900	4.9
Ottawa	13,100	12,244	800	6.7	2.50	2.57	34,100	32,870	1,200	3.7
Pawnee	6,400	5,745	700	11.4	2.63	2.65	16,900	15,310	1,600	10.7
Payne	23,700	22,119	1,600	7.1	2.35	2.40	65,100	62,435	2,700	4.3
Pittsburg	16,200	15,036	1,200	7.9	2.53	2.57	43,500	40,524	3,000	7.4
Pontotoc	13,500	12,268	1,200	10.1	2.48	2.54	35,000	32,598	2,400	7.5
Pottawatomie	22,900	20,062	2,800	14.0	2.65	2.67	62,200	55,239	6,900	12.5
Pushataha	4,700	4,355	300	7.6	2.58	2.67	12,300	11,773	500	4.1
Roger Mills	2,000	1,769	300	14.8	2.77	2.69	5,700	4,799	900	18.1
Rogers	18,900	15,650	3,300	21.0	2.88	2.94	55,200	46,436	8,700	18.8
Seminole	10,700	10,158	600	5.7	2.65	2.65	29,100	27,473	1,600	6.0
Sequoyah	12,100	10,473	1,600	15.1	2.81	2.90	34,300	30,749	3,500	11.4
Stephens	17,200	16,512	700	4.1	2.58	2.59	45,000	43,419	1,500	3.5
Texas	6,800	6,332	400	6.8	2.63	2.74	18,200	17,727	500	2.7
Tillman	4,500	4,681	-200	-3.5	2.49	2.58	11,600	12,398	-800	-6.5
Tulsa	205,000	181,620	23,400	12.9	2.45	2.54	512,000	470,593	41,400	8.8
Wagoner	16,900	13,768	3,100	22.7	2.95	3.02	50,100	41,801	8,300	19.9
Washington	18,500	18,750	-200	-1.3	2.47	2.53	46,400	48,113	-1,700	-3.6
Washita	5,300	5,138	200	2.9	2.63	2.64	14,200	13,798	400	2.6
Woods	4,300	4,425	-100	-2.0	2.31	2.33	10,600	10,923	-300	-3.0
Woodward	8,000	7,582	400	5.0	2.75	2.73	22,400	21,172	1,200	5.9
Oregon	1,044,000	991,593	53,000	5.3	2.52	2.60	2,686,000	2,633,105	53,000	2.0
Baker	6,400	6,169	200	3.6	2.45	2.58	15,900	16,134	-300	-1.8

REFERENCE 35

RECORD OF COMMUNICATION

TYPE: Phone Call | **DATE:** 8-3-90 | **TIME:** 4:17 p.m.

TO: Paula Parker
Bethany Chamber of Commerce
Bethany, Oklahoma
405-789-1256

FROM: Robert Taaffe
FIT Chemist
ICF Technology
214-744-1641

SUBJECT: Population of Bethany, Oklahoma

SUMMARY OF COMMUNICATION

Paula informed me that the population of Bethany, Oklahoma is approximately 23,000.

Robert Taaffe

REFERENCE 36

RECORD OF COMMUNICATION

TYPE: Telephone Call **DATE:** 5-21-91 **TIME:** 10:30 a.m.

TO: Kevin Jaynes KJ FIT Biologist ICF Technology, Inc. Dallas, Texas 214-744-1641	**FROM:** Dan Spitz Hydrogeologist TECHRAD Environmental Services, Inc. OKC, Oklahoma 405-528-7016

SUBJECT: The Location and Status of the USTs at Hangar 6 and Triton Air.

SUMMARY OF COMMUNICATION

Mr. Spitz returned my call. I asked him about the status of a UST located at Hangar 6, he explained that this tank is in non-compliance and is scheduled for removal in the very near future.

I asked Mr. Spitz about two tanks at Triton Air that were indicated on the original October 1990 list of tanks. He indicated that he was not sure if they were on airport property and possibly were owned by them themselves.

I asked Mr. Spitz about the USTs identified by the FIT at Hangar 8A Air Center, Inc. Mr. Spitz indicated that WPA told TECHRAD that these were actually sumps that drained into the old lagoon and have reportedly been cleaned up.

Mr. Spitz continued saying that to his knowledge OWRB has not been out to check WPA. Mr. Spitz indicated that ground water had been impacted but doesn't know of any other work that has been done.

REFERENCE 37

RECORD OF COMMUNICATION

Reference 37

TYPE: Telephone Call **DATE:** 6-28-91 **TIME:** 4:00 p.m.

TO: Craig Davis
City of Bethany Water Department
Bethany, Oklahoma
405-789-1421

FROM: Kevin Jaynes
FIT Biologist
ICF Technology, Inc.
Dallas, Texas
214-744-1641

SUBJECT: Wells Locations

SUMMARY OF COMMUNICATION

Well G-3 is currently inactive due to pump problems.

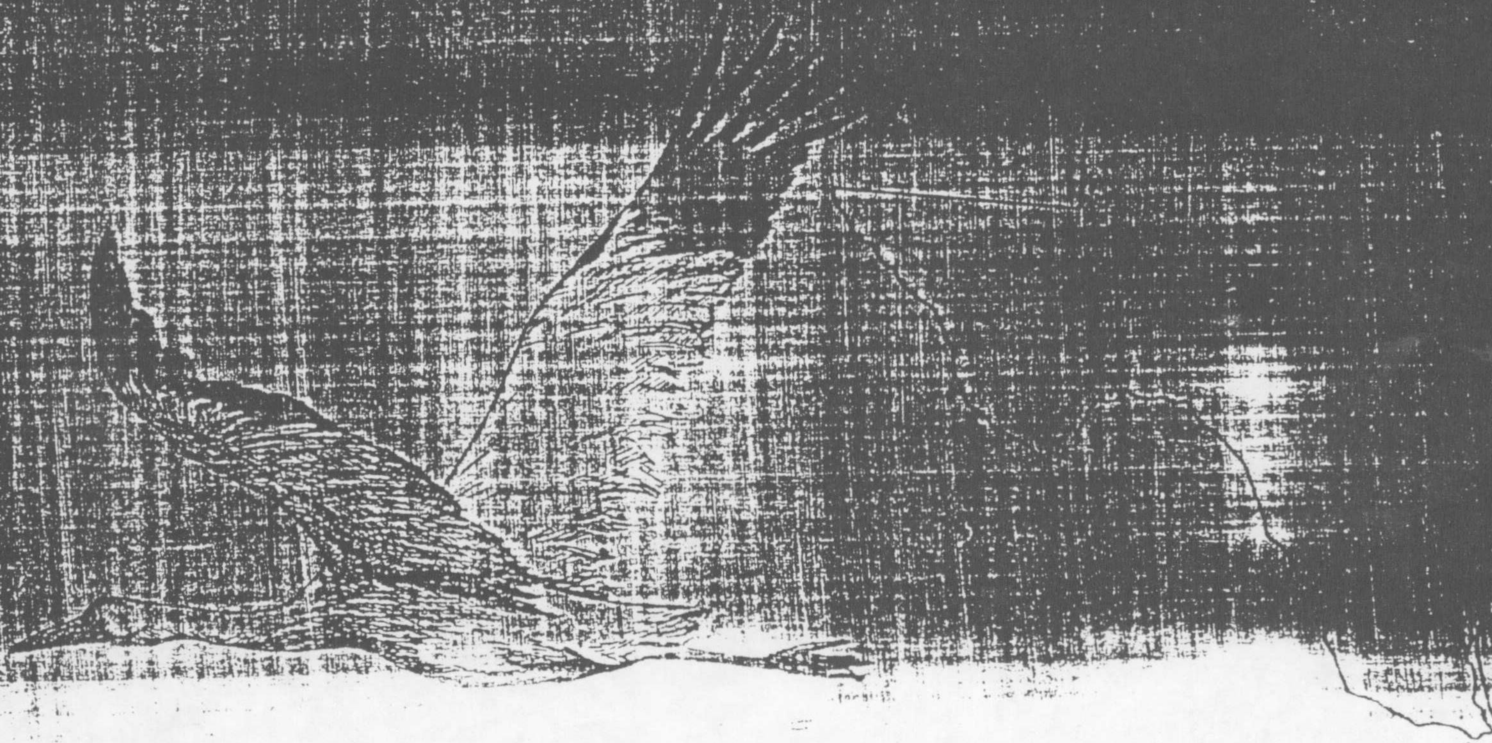
The Garber wells G-1 and G-2 are not treated or pooled but are chlorinated and pumped into the system.

Well No. 16 is now used by the Tri-City ball park for watering and sprinkler systems. It is located just 300 feet south of Well No.18. Actually only 27 wells are active including G-3 when it goes on line again.

REFERENCE 38

Endangered and Threatened Species of Texas and Oklahoma 1987

(WITH 1988 ADDENDUM)



INTERIOR LEAST TERN (Interior population) *Sterna antillarum*

STATUS: Threatened (50 FR 21784; May 28, 1985) without critical habitat

SPECIES DESCRIPTION: Least terns are small birds with a 20-inch (50 cm) wingspread. Sexes are alike, characterized in the breeding plumage by a black crown, white forehead, grayish back and dorsal wing surfaces, snowy white undersurfaces, orange legs, and a black-tipped yellow bill. Breeding colonies contain from about 5 to 75 nests.

HABITAT: Important characteristics of its breeding habitat include: (1) the presence of bare or nearly bare ground on alluvial islands or sandbars for nesting, (2) the availability of food (primarily small fish), and (3) the existence of favorable water levels during the nesting season (so nests remain above water).

DISTRIBUTION:

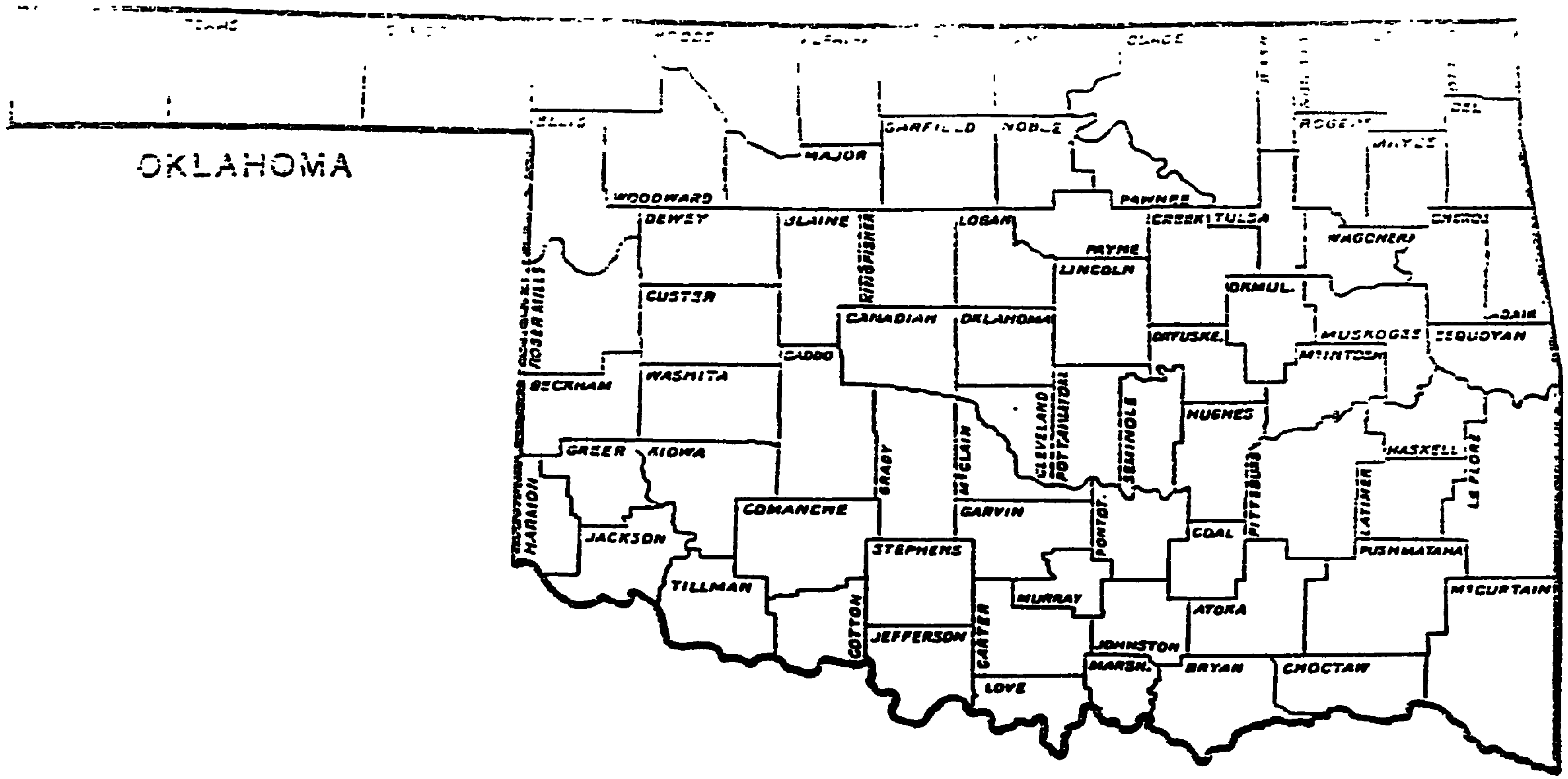
Historic: Sand bars on the Colorado (in Texas), Red, Rio Grande, Arkansas, Missouri, Ohio, and Mississippi River systems; braided rivers of northwest Oklahoma and southwest Kansas; (salt) flats of northwest Oklahoma (Salt Plains National Wildlife Refuge); mud playa lakes in southeastern New Mexico (Bitter Lakes National Wildlife Refuge).

Present: Terns presently occur as small remnant colonies within their historic distribution.

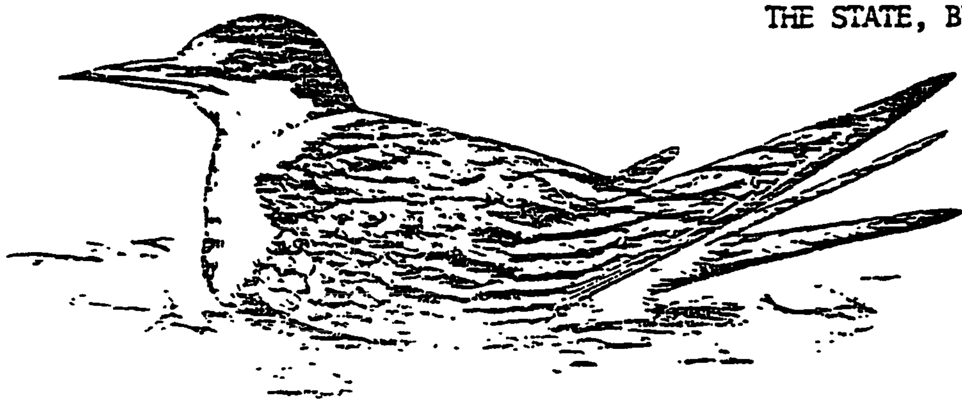
REASONS FOR DECLINE: Many nesting areas have been permanently inundated or destroyed by reservoirs and channelization projects. Alteration of natural river or lake dynamics has caused unfavorable vegetational succession on many remaining islands, curtailing their use as nesting sites by terns. Recreational use of sandbars is a major threat to the tern's reproductive success. Release of reservoir water and annual spring floods often inundate nests.

OTHER INFORMATION: Recovery plan drafted in 1986. The Service is working with the States of New Mexico, Texas, Oklahoma, and the Bureau of Reclamation to monitor tern populations. The Service is also working with The Nature Conservancy to protect tern habitat along the Arkansas River near Tulsa, Oklahoma, and with the U.S. Army Corps of Engineers to protect tern habitat at Optima Reservoir, northwestern Oklahoma.

REFERENCES: Downing 1980, Grover and Knopf 1982, Faanes 1983, Hill 1985, Boyd 1986, USFWS 1986a.



CAN BE FOUND DURING THE BREEDING SEASON THROUGHOUT THE STATE, BUT ONLY NEST IN SUITABLE HABITAT



INTERIOR LEAST TERN

STATUS: Endangered (32 FR 4001, March 11, 1967; 35 FR 8495, June 2, 1970) with critical habitat (43 FR 20938, May 15, 1978)

SPECIES DESCRIPTION: The tallest American bird; males approach 5 feet tall. A very large, snowy white, long-necked bird with long legs that normally trail behind in flight. Also has black primary feathers, a red crown, and a wedge-shaped patch of black feathers behind the eye.

HABITAT: Marshes, river bottoms, potholes, prairies, cropland. Whooping cranes feed on small grains (corn, wheat, sorghum, barley) in agricultural fields, green forage (alfalfa, winter wheat), aquatic plants (tubers and leaves), insects, crustaceans, and small vertebrate animals.

DISTRIBUTION:

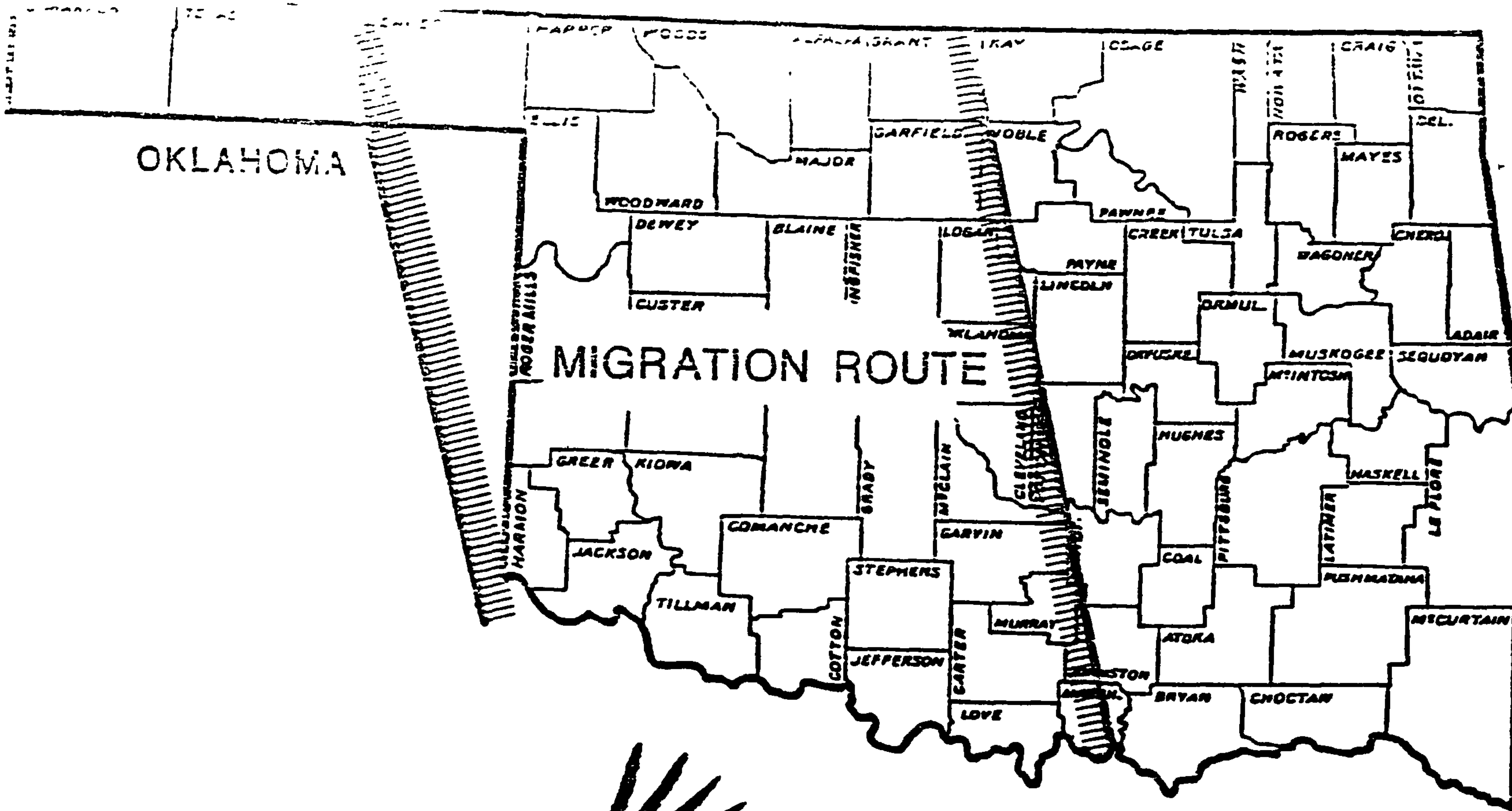
<u>Historic</u>: Originally found over most of North America. In the 19th century the main breeding area was from the Northwest Territories in Canada to the prairie provinces and northern prairie states to Illinois. A non-migratory flock existed in Louisiana, but is now extinct. Wintered in the Carolinas, along the Texas Gulf coast, and the high plateaus of Mexico.

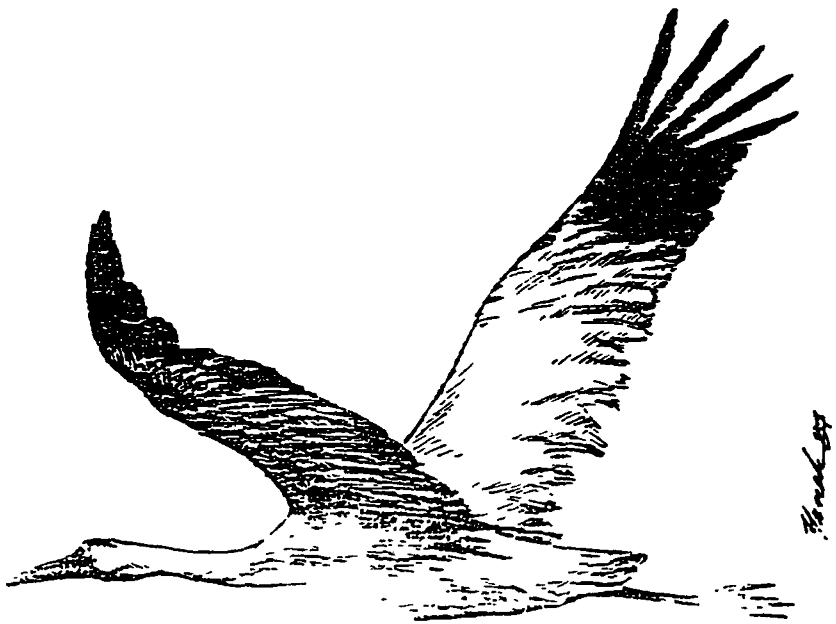
<u>Present</u>: Passes through western Oklahoma on its migration (October-November in the fall, April-May in the spring). Salt Plains NWR, near Jet, Oklahoma, is a very important migration stopover area. Numerous stopover areas exist including the Canadian, Red, and Cimarron Rivers and grain fields. Migrate as singles, pairs, family groups (normally 3) or in small flocks, sometimes in the company of sandhill cranes.

REASONS FOR DECLINE: Destruction of wintering and breeding habitat, shooting, collisions with powerlines and fences, specimen collecting, and human disturbance.

OTHER INFORMATION: The recovery team was appointed in 1976 and first recovery plan published in 1980. The recovery plan was revised in 1986. Protected by Canada and Mexico. Intensive captive-breeding program is being conducted by the Service and by the Canadian Wildlife Service.

REFERENCES: Allen [illegible]





WHOOPING CRANE

REFERENCE 39

MITRE

26 May 1989
W52-214

Ms Lucy Sibold
U.S. Environmental Protection Agency
401 M Street, S W
Room 2636, Mail Code WH-548A
Washington, D.C. 20460

Dear Ms Sibold.

Enclosed is a copy of the draft revised HRS net precipitation values for 3,345 weather stations where data were available. The data are presented by state code, station name, latitude longitude, and net precipitation in inches A list of state codes is also enclosed

The net precipitation values are provided to assist the Phase II Field Testing efforts. It is suggested that the value from the nearest weather station in a similar geographic setting be used as the net precipitation value for a site.

If there are any questions regarding this material, please contact Dave Egan at (703) 883-7866.

Sincerely,

Andrew M. Platt
Group Leader
Hazardous Waste Systems

AMP:DEE/hme

Enclosures

cc: Scott Parrish

OBS	STATE	NAME		LATNUM	LONNUM	NETPREC
2201	33	OBERLIN		41.18	82.13	13.0125
2202	33	HIRAM		41.19	81.09	18.5179
2203	33	ELYRIA 3 E		41.23	82.04	13.8848
2204	33	BOWLING GREEN SWG PL		41.23	83.38	11.5001
2205	33	NAPOLEON WATER WORKS		41.23	84.08	13.3265
2206	33	CLEVELAND WSO	//R	41.25	81.52	14.5957
2207	33	SANDUSKY	R	41.27	82.43	12.2687
2208	33	WAUSEON WASTE WTR PLT		41.33	84.08	14.0496
2209	33	CHARDON		41.35	81.13	22.4792
2210	33	TOLEDO EXPRESS WSO	R	41.35	83.48	12.3882
2211	33	MONTPELIER 1 WSW		41.35	84.34	12.8773
2212	33	PUT IN BAY PERRY MON		41.39	82.48	11.3873
2213	33	TOLEDO BLADE		41.39	83.32	12.2873
2214	33	PAINESVILLE 4 NW		41.45	81.18	14.6371
2215	33	ASHTABULA		41.51	80.48	16.0639
2216	34	IDABEL		33.53	94.49	20.2482
2217	34	MARIETTA 3 NW		33.59	97.07	8.7602
2218	34	HUGO		34.01	95.30	16.8022
2219	34	MADILL		34.05	96.46	11.6889
2220	34	ARDMORE		34.10	97.08	8.3155
2221	34	WAURIKA		34.10	98.00	5.3553
2222	34	ANTLERS 2 ENE		34.15	95.36	18.1750
2223	34	WALTERS		34.21	98.19	6.4415
2224	34	FREDERICK		34.24	99.01	3.2794
2225	34	TIPTON 4 S		34.26	99.08	3.0716
2226	34	CHATTANOOGA 3 NE		34.27	98.37	4.2411
2227	34	DUNCAN		34.30	97.57	6.3376
2228	34	ALTUS IRR. RESCH STN		34.35	99.20	2.3477
2229	34	LAWTON		34.37	98.27	6.0852
2230	34	HOLLIS		34.41	99.55	1.4067
2231	34	WICHITA MT WL REF		34.44	98.43	5.5193
2232	34	PAULS VALLEY		34.45	97.13	9.1892
2233	34	ADA		34.47	96.41	11.6617
2234	34	MANGUM RESEARCH STA		34.50	99.26	2.1961
2235	34	MCALESTER FAA AIRPORT		34.53	95.47	15.9778
2236	34	WISTER DAM		34.56	94.43	16.1714
2237	34	WILBURTON 9 ENE		34.56	95.09	17.8935
2238	34	PURCELL		35.00	97.22	9.3220
2239	34	HOBART FAA AIRPORT		35.00	99.03	3.5027
2240	34	CHICKASHA EXP STATION		35.03	97.55	5.4221
2241	34	POTEAU		35.04	94.38	17.2077
2242	34	ANADARKO		35.04	98.14	5.1966
2243	34	HOLDENVILLE		35.05	96.24	11.6238
2244	34	CARNEGIE 4 ENE		35.08	98.33	4.3843
2245	34	ERICK 4 E		35.12	99.48	2.3813
2246	34	SEMINOLE		35.14	96.40	9.6861
2247	34	OKLAHOMA CITY WSFO	//R	35.24	97.36	7.0937
2248	34	OKEMAH		35.26	96.18	10.0193
2249	34	SALLISAW		35.28	94.47	15.7433
2250	34	MEEKER 1 E		35.30	96.53	8.9983
2251	34	WEBBERS FALLS		35.31	95.08	15.2686
2252	34	CLINTON		35.31	98.58	4.8464
2253	34	WEATHERFORD		35.32	98.42	4.0004
2254	34	EL RENO 1 N		35.33	97.58	5.9158
2255	34	OKMULGEE WATER WORKS		35.37	96.01	11.6742